Vol. 1014 Number 4

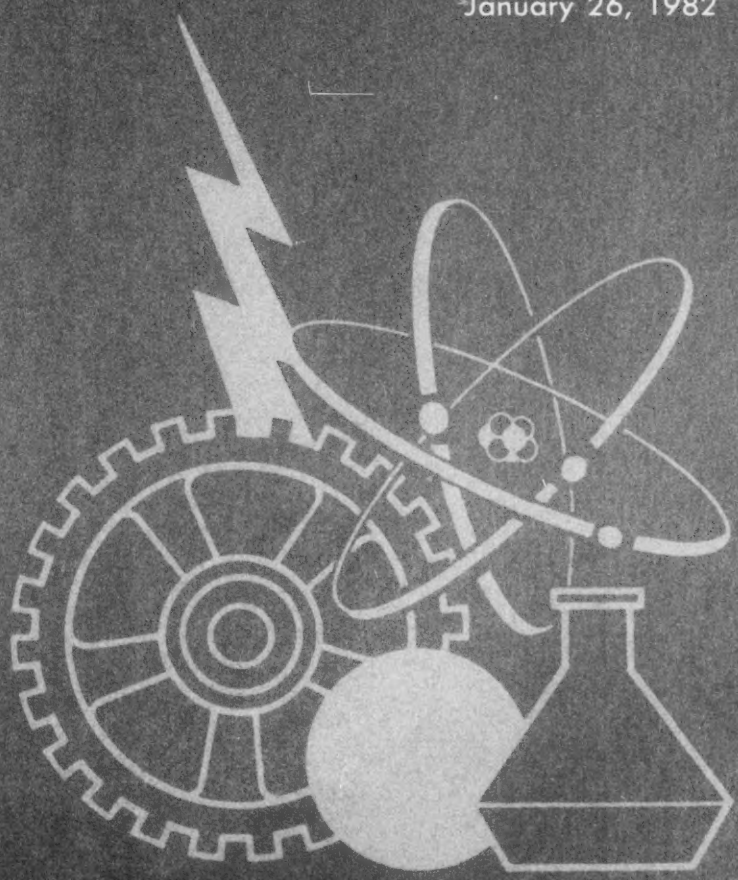
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 26, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 26, 1982 Volume 1014 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $360.00 per annum for first-class mailing, also available as fourth-class mail at $250.00 domestic; $312.50 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $6.50 domestic, $8.15 foreign.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,517,436, Re. S.N. 310,241, Filed Oct. 9, 1981, Cl. 29/613, PRECISION RESISTOR OF GREAT STABILITY, Felix Zandman, Owner of Record: *Vishay Intertechnology, Inc., Malvern, Pa.,* Attorney or Agent: Thomas M. Ferrill, Jr., et al., Ex. Gp.: 321

4,149,239, Re. S.N. 244,801, Filed Mar. 17, 1981, Cl. 364/200, SECONDARY STORAGE FACILITY FOR CONNECTING TO A DIGITAL DATA PROCESSING SYSTEM BY SEPARATE CONTROL INFORMATION AND DATA TRANSFER PATHS, Stephen R. Jenkins, et al., Owner of Record: *Digital Equipment Corp., Raynard, Mass.,* Attorney or Agent: None, Ex. Gp.: 237

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

No Publications This Issue

National Inventors Day

The Patent and Trademark Office and the National Council of Patent Law Associations will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 6, 1982, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 7, 1982, from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, Feb. 7, 1982, during which time a number of inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 5, 1982, at 5:00 p.m. The removal of all personal property from the Search Room by the early closing time would be appreciated.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Jan. 5, 1982.

Trademark Errata

In the Official Gazette of Dec. 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 91, "986,182. MUSICRAFT AND DESIGN. U.S. Cl. 101. 6-11-74" should be deleted.

In the Official Gazette of Dec. 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 91, "986,211. COLLEX. U.S. Cl. 103. 6-11-74" should be deleted.

In the Official Gazette of Dec. 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 92, "986,448. TINY TALK. U.S. Cl. 38. 6-18-74" should be deleted.

In the Official Gazette of Dec. 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 93, "986,571. FUN & FANCY. U.S. Cl. 50. 6-18-74" should be deleted.

In the Official Gazette of Dec. 9, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 93, "986,645. Q&T. U.S. Cl. 101. 6-18-74" should be deleted.

In the Official Gazette of June 30, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 763, "1,003,855. STAR CHEESEBURGER. INT. Cl. 42. 2-4-75" should be deleted.

In the Official Gazette of June 30, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 763, "1,003,928. VISTACON. U.S. Cl. 21. 2-4-75" should be deleted.

In the Official Gazette of June 30, 1981 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 763, "1,004,025. JEAN-PASCAL. U.S. Cls. 39 and 42. 2-4-75" should be deleted.

Patent Errata

"All reference to Patent No. 4,287,937 to Michael J. Pryor and Derek E. Tyler, both of Connecticut for CONTINUOUS LUBRICATION CASTING MOLDS appearing in the Official Gazette of Sept. 8, 1981 should be deleted since no patent was issued."

"All reference to Patent No. 4,298,659 to Howard H. Liebermann and Peter George Frischmann both of New York and George Mowry Rosenberry, Jr., of Tennessee for HELICAL METALLIC RIBBON FOR CONTINUOUS EDGE WINDING APPLICATIONS appearing in the Official Gazette of Nov. 3, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,303,809 to Herbert J. Rubinstein and Morton K. Rubinstein both of California for LOCKING DEVICE FOR TELEPHONE INSTRUMENT appearing in the Official Gazette of Dec. 1, 1981 should be deleted since no patent was granted."

Status of PTO Services

The following is an update of the status of PTO services as of Jan. 4, 1982:

Service Item	Performance Goal (Calendar Days)	Actual	Comment
Mail Processing & Delivery	4	4	
Filing Receipts:			
Patents	22	94	Holiday absenteeism prevented improvements during December.
Trademarks	42	64	Increase due to renovation disruptions.
Patent Copies:			
Window Coupons	5	99% within 4 days 99% within 10 days	
Mail Coupons	15	95% within 6 days 99% within 10 days	
Letter Orders	20	95% within 15 days 99% within 20 days	
Certified Copies:			
Trademark Regs.	30	54	Holiday absenteeism prevented improvements during December.
All other	Being established	95% within 15 days 99% within 20 days	
Trademark Search Room:			
Filing Drawings	21	34	Actual is high due to renovation disruptions.
Filing Reg. Certificates	3	37	
Patent Assignments	15	47	Reflects a 10 day reduction since last month.
Trademark Assignments	21	60	Reflects a 10 day reduction since last month.
Patent Official Gazette	Issue Date	On schedule	
Patent Grants	Issue Date	6 days late	Contractor problems due to holiday absenteeism.
Trademark Official Gazette	Issue Date	On schedule	
Trademark Registrations	Issue Date	20 days late	Holiday absenteeism prevented improvements.

Jan. 4, 1982.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 26, 1982

Re. 30,744	4,251,426	4,282,330	4,294,382
3,554,296	4,252,932	4,282,401	4,294,467
3,752,133	4,255,287	4,282,906	4,294,538
3,771,336	4,256,228	4,283,020	4,294,581
3,989,666	4,256,359	4,283,229	4,294,724
3,996,188	4,261,254	4,283,444	4,294,960
4,027,073	4,262,411	4,283,759	4,295,252
4,056,460	4,262,985	4,284,408	4,295,272
4,108,882	4,264,462	4,285,258	4,295,424
4,116,818	4,265,082	4,286,037	4,295,829
4,152,250	4,265,508	4,286,417	4,296,002
4,159,181	4,267,314	4,286,567	4,296,255
4,169,086	4,267,859	4,286,796	4,296,849
4,178,153	4,268,520	4,286,802	4,297,224
4,184,866	4,270,139	4,287,040	4,297,266
4,192,552	4,270,505	4,287,326	4,297,435
4,192,553	4,272,490	4,287,419	4,297,571
4,218,454	4,273,287	4,287,552	4,297,961
4,238,585	4,273,411	4,287,558	4,297,985
4,240,738	4,274,147	4,289,021	4,298,027
4,241,488	4,274,276	4,289,080	4,298,160
4,242,440	4,274,651	4,289,462	4,298,543
4,242,683	4,278,749	4,289,890	4,298,762
4,245,728	4,279,713	4,290,390	4,299,391
4,246,433	4,279,765	4,290,613	4,299,583
4,246,670	4,279,833	4,291,600	4,299,697
4,248,065	4,280,491	4,291,831	4,299,836
4,248,115	4,281,491	4,292,495	4,300,327
4,248,301	4,281,820	4,293,198	4,300,329
4,248,706	4,282,021	4,293,737	
4,250,158	4,282,154	4,293,951	
4,251,012	4,282,161	4,294,171	

Disclaimer

3,309,131.—*Walter Selden Saunders,* West Chester, Pa. MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES. Patent dated Mar. 14, 1967. Disclaimer filed Mar. 16, 1977, by the inventor.

The term of this patent subsequent to Mar. 22, 1983, has been disclaimed.

3,682,247.—*Stanley C. Jones,* Littleton, Colo. USE OF WATER-EXTERNAL MICELLAR DISPERSIONS IN OIL RECOVERY. Patent dated Aug. 8, 1972. Disclaimer filed Oct. 9, 1981, by the assignee, *Marathon Oil Co.*

Hereby enters this disclaimer to all of the claims of said patent.

4,023,129.—*Jerrold Kerwin Kratz* and *Edward Walter Christensen, II,* Indianapolis, Ind. DEFLECTION YOKE WITH NON-RADIAL CONDUCTORS. Patent dated May 10, 1977. Disclaimer filed Nov. 12, 1981, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

4,127,021.—*Andrew L. Johnson,* Skokie, Ill. TUBE FLARING SET. Patent dated Nov. 28, 1978. Disclaimer filed Dec. 18, 1978, by the inventor.

Hereby enters this disclaimer to claims 1 through 5 inclusive of said patent.

4,168,388.—*Edward R. Lavagnino; Bryan B. Molloy* and *Paul Pranc,* Indianapolis, Ind. TRIFLUOROMETHYLPHENYL BENZYL ETHERS. Patent dated Sept. 18, 1979. Disclaimer filed Nov. 16, 1981, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to all of the claims of said patent.

Disclaimer and Dedication

3,891,079.—*Howard Frank Roper,* Upwey, Australia. BULK MATERIAL UNLOADER. Patent dated June 24, 1975. Disclaimer and Dedication filed Dec. 6, 1976, by the assignee, *The Broken Hill Proprietary Co. Ltd.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,038,187.—*Edward P. Saffran,* Mukwonago, Wis. MICROSCREEN DRUM. Patent dated July 26, 1977. Disclaimer and Dedication filed Aug. 18, 1981, by the assignee, *Envirex, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 28, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-06-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-15-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-17-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-08-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-11-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-06-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-06-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-14-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-23-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-04-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-17-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during November 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,154,787 to 3,158,866, inclusive

Plant Patents ..... Numbers 2,451 to 2,454, inclusive

REISSUES

JANUARY 26, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

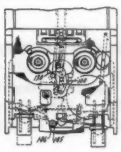
Re. 30,853
CASSETTE RECORD PLAYER-RECORDER

Kenneth B. Harper, Winnetka, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Original No. 4,107,749, dated Aug. 15, 1978, Ser. No. 39,500, May 21, 1970. Division of Ser. No. 730,790, May 21, 1968, Pat. No. 3,531,127. Application for reissue Sep. 30, 1980, Ser. No. 192,410

Int. Cl.³ G03B *1/04;* **G11B** *15/32, 5/54*

U.S. Cl. 242—198 **14 Claims**



1. A tape drive unit for a tape recorder comprising a takeup reel shaft, a friction disc operatively connected with a drive source normally for driving the shaft *in a tape play mode, a tape head positioned in contact with a tape to be played while said friction disc drives said shaft in said tape play mode,* a transmission roller operable to operatively connect the shaft with the drive source, thereby causing the shaft to be driven at a different *and higher* number of revolutions from that provided by said friction disc *to provide a fast tape drive mode,* control means, *operative to interrupt said play mode and implement said fast mode in response to applying manual pressure to an actuator,* to disengage the friction disc from operative connection with the shaft and at the same time to engage the transmission roller respectively with the shaft *as well as to move said tape head to disengage said tape head from contact with said tape,* and reset means for *automatically* resetting said control means *to resume said play mode in response to the release of manual pressure from said actuator by repositioning said tape head in contact with said tape and by disengaging said transmission roller from said shaft and operatively reengaging the friction disc with the shaft.*

Re. 30,854
FREE MACHINING CU—NI—SN ALLOYS

John T. Plewes, Berkeley Heights, and Philip R. White, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 4,130,421, dated Dec. 19, 1978, Ser. No. 866,023, Dec. 30, 1977. Application for reissue Sep. 22, 1980, Ser. No. 189,379

Int. Cl.³ C22C *9/06, 9/02*

U.S. Cl. 75—154 **16 Claims**

1. Article of manufacture comprising a copper based alloy which is shaped by machining, an aggregate amount of at least 90 weight percent of said alloy consisting of Cu, Ni, Sn, and at least one additive, said aggregate amount having a Ni content in the range of three weight percent to 30 weight percent, said aggregate amount having a Sn content in a range of three weight percent to an upper limit which is a linear function of said Ni content, said upper limit being ten weight percent when said Ni content is three weight percent and said upper limit being 12 weight percent when said Ni content is 30 weight percent, and CHARACTERIZED IN THAT said additive is [selected from the group consisting of Se in the range of 0.1–0.5 weight percent of said aggregate amount, Te in the range of 0.1–0.5 weight percent of said aggregate amount, Pb in the range of 0.1–0.2 weight percent of said aggregate amount, and] MnS in the range of 0.2–2.0 weight percent of said aggregate amount.

Re. 30,855
POWDER METAL COMPOSITION

Yew-Tsung Chen, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Original No. 4,170,474, dated Oct. 9, 1979, Ser. No. 953,361, Oct. 23, 1978. Application for reissue Feb. 20, 1981, Ser. No. 236,481

Int. Cl.³ C22C *33/02, 38/42, 38/44*

U.S. Cl. 75—251 **6 Claims**

1. A powder metal composition comprising:
1.0–2.5% Ni, 0.3–0.7 Mo, 0.15–0.30 Mn, 0.5–1.5% Cu, 0.3–0.7 C, 0.50–1.0% zinc stearate, the balance being Fe.

Re. 30,856
POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Calif., assignors to United States of America, Washington, D.C.

Original No. 4,075,108, dated Feb. 21, 1978, Ser. No. 636,062, Nov. 28, 1975. Continuation-in-part of Ser. No. 454,939, Mar. 26, 1974, abandoned. Application for reissue Feb. 7, 1980, Ser. No. 119,229

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—41 **25 Claims**

1. A process for producing a polycarbonate membrane useful for hemodialysis which comprises casting on to a substrate surface having a smooth finish a layer of casting solution comprising a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 50,000 to about 750,000 as determined by the intrinsic viscosity measurement and containing from about 5 to about 35% by weight of repeating alkylene ether units and correspondingly from about 95 to about 65% by weight of repeating bisphenol A-carbonate units and a water-miscible organic solvent together with a cosolvent which acts as a swelling agent for said copolymer, drying said layer to partially evaporate the solvents therefrom, immersing said partially dried layer in water to form a gelled membrane, and stripping said gelled membrane from said substrate surface.

PLANT PATENTS

GRANTED JANUARY 26, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,811
ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 22, 1980, Ser. No. 189,752
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by red buds becoming reddish purple blooms borne primarily singly developing into Indian Lake red upon aging.

4,812
ROSE PLANT 70-10341-18

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 22, 1980, Ser. No. 189,788
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous upright plant, reddish new foliage, shell pink flowers with very stiff petals, and little fragrance.

4,813
ROSE PLANT 72-14691

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 23, 1980, Ser. No. 189,570
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, slightly angular plant habit, near white buds opening into non-fragrant, double white blooms.

4,814
ALMOND TREE

Fred B. Urline, Winton, Calif., assignor to Jenette P. Thurman; Karen K. Howe; Susan A. Bizzack; Richard D. Urline and Sharon D. Williams, all of Winton, Calif.

Filed Nov. 28, 1980, Ser. No. 211,060
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by a tree which resembles the Mission in shape but is larger; and by blooming substantially with and pollenizing the Nonpareil, but in harvest after the Nonpareil and before the Merced.

4,815
WHITE FLOWERING CRABAPPLE TREE

Lester L. Demaline, Avon, Ohio, assignor to Willoway Nurseries, Inc., Avon, Ohio

Filed Mar. 13, 1980, Ser. No. 130,144
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of flowering crabapple tree, *Malus cultivar,* substantially as shown and described herein.

4,816
KALANCHOE PLANT

Moritz Bürki, Langendorf, Switzerland, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed Sep. 11, 1980, Ser. No. 186,277
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant known by the cultivar name Pollux, as described and illustrated, and particularly characterized by the combined characteristics of bright red flower color and highly floriferous habit, compact growth habit, freely branching habit, relatively slow growth, adaptability to production in 10 to 15 cm. pots, and by its flowering time of 11 weeks in summer up to 15 weeks in winter.

4,817
KALANCHOE PLANT

Moritz Bürki, Langendorf, Switzerland, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 11, 1980, Ser. No. 186,502
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant known by the cultivar name Regulus, as described and illustrated, and particularly characterized by the combined characteristics of bright orange flower color and floriferous habit, compact and relatively slow growth habit, freely branching habit, excellent and full flower placement, adaptability to production in 10 to 15 cm. pots, and by its flowering time of 11 weeks in summer and 15 weeks in winter after start of short days.

4,818
CALLISSIA PLANT

Charles J. Faist, 5313-A Calle Minorca, Sarasota, Fla. 33581, and B. George Weich, Summerwood Farms, Corner Border & Jackson Rds., Venice, Fla. 33595

Filed May 27, 1980, Ser. No. 153,615
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Callissia plant substantially as described and illustrated, characterized particularly as to novelty by its solid pink leaves, variegated leaves and pink stems.

PATENTS

GRANTED JAN. 26, 1982

ERRATA

For CLASS	See PATENT NO.
056–400	4,312,095
112–178	4,312,290
405–291	4,312,609
376–299	4,312,703
376–265	4,312,704
376–441	4,312,705
376–442	4,312,706
376–450	4,312,707
376–203	4,312,708

PATENTS

GRANTED JAN. 16, 1962

PATENTS

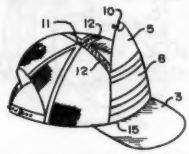
GRANTED JANUARY 26, 1982

GENERAL AND MECHANICAL

4,312,076
CAP WITH INTEGRAL POCKET

Robert J. Gamm, Olivette, Mo., assignor to Envoys U.S.A., Inc., St. Louis, Mo.

Filed Oct. 9, 1980, Ser. No. 195,330
Int. Cl.³ A42B 1/24
U.S. Cl. 2—199 **6 Claims**



1. In a pocket for a cap and designed to hold smaller size personal items such as keys, coins, or the like, as during participation in a sporting event, during working, or similar activity, comprising, said cap having a head covering portion and a bill arranged forwardly thereof, a pocket stitched to the head covering portion along a segment thereof, said pocket being formed along a frontal segment of the cap head covering portion, said pocket overlying said segment of the head covering portion, said pocket being formed of a pair of liners, one liner being the inner liner and comprising the said head covering portion segment, the other liner comprising an outer liner, and being secured with the inner liner along select edges at its periphery for forming the pocket between said liners, said liners being secured together and with the cap along their lower and side edges, with the lower edge securement being arranged proximate the location of the cap bill, and with entrance into the pocket being attained through the spacing between their separable upper edges, a closure member formed foldably connecting with the formed pocket and capable of providing a closing thereof, said closure member being foldably connected with the outer liner along its upper edge thereof, said closure member extending upwardly towards the apex of the head covering portion, a fastening means connecting with the closure member for securing it into closure after the identified type of items may be inserted therein for safekeeping, and said fastening means securing with the closure member being located at the said apex and disposed for fastening therewith.

4,312,077
METHOD OF FASTENING BUTTONS AND THE LIKE TO A TEXTILE MATERIAL AND AN APPARATUS FOR PRACTISING SUCH METHOD

Bengt O. Petersson, Kungsbacka, Sweden, assignor to Bengt Petersson New Products Investment AB, Askim, Sweden

PCT No. PCT/SE79/00055, § 371 Date Nov. 16, 1979, § 102(e) Date Nov. 8, 1979, PCT Pub. No. WO79/00777, PCT Pub. Date Oct. 18, 1979
PCT Filed Mar. 13, 1979, Ser. No. 173,199
Claims priority, application Sweden, Mar. 16, 1978, 7803025; Nov. 17, 1978, 7811869; Jan. 18, 1979, 7900444; Mar. 5, 1979, 7901967
Int. Cl.³ A44B 1/42; B23K 21/02
U.S. Cl. 2—265 **8 Claims**

1. A method of fastening a button or the like to a garment such that the garment will be buttoned up after the fastening operation, wherein said button is composed of plastic and initially comprises a button head and a stem projecting from the button head, the stem having an outer end for piercing the garment and for deformation by ultrasonic vibration, a central section characterized by a substantially smooth profile, and an inner section flaring into the button head, the method comprising the steps of:

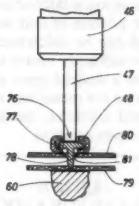
providing a button hole in a first portion of the garment;

placing said first garment portion in an overlying relation with a second portion of the garment;

positioning said button such that the button head is disposed on the side of said first garment portion opposite to said second garment portion and such that the stem extends through the button hole and pierces at least partly through said second garment portion; and

deforming the outer end of the stem by ultrasonic vibration thereof.

6. A machine for fastening a button or the like to a garment such that the garment will be buttoned up after the fastening



operation, wherein said button initially comprises a button head and a stem projecting from the button head, and wherein said garment comprises a first portion provided with a button hole and a second portion, the machine comprising:

means for placing said first garment portion in an overlying relation with said second garment portion;

means for stretching both garment portions;

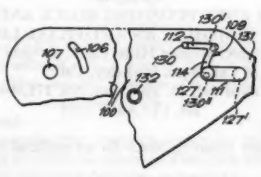
means for positioning said button such that the button head is disposed on the side of said first garment portion opposite to said second garment portion and such that the stem extends through the button hole and pierces at least partly through said second garment portion; and

means for ultrasonically vibrating the portion of the stem piercing at least partly through said second garment portion such that said stem portion deforms.

4,312,078
HELMET WITH PIVOTABLE VISOR

John M. Pollitt, and Dennis M. Hill, both of Stranraer, Scotland, assignors to Kangol Helmets Limited, Stranraer, Scotland

Filed Feb. 25, 1980, Ser. No. 124,108
Claims priority, application United Kingdom, Feb. 26, 1979, 06665/79
Int. Cl.³ A42B 3/02
U.S. Cl. 2—424 **10 Claims**



1. A helmet comprising body means, an eye aperture in said body means, first and second pivot means, visor means

mounted on said body means by said pivot means for opening pivoting movement from a closed position closing said eye aperture, at least one of said first and second pivot means comprising first pin means in one of said body means and said visor means and an elongate first recess in the other of said body means and said visor means, said first recess receiving said first pin means therein and cooperating therewith to permit translational movement of said visor means towards and away from said body means when said visor means is in said closed position, second pin means on one of said body means and said visor means and a second recess in the other of said body means and said visor means, said second recess receiving said second pin means and having a single elongate portion accommodating said translational movement and an adjoining arcuate portion accommodating said pivoting movement from said closed position of said visor means when said visor means has been translationally moved away from said body means, and frictional means operative between said body means and said visor means frictionally opposing said pivotal movement, whereby said visor means when moved toward said body means in said closed position is latched in place by cooperation of said single elongate portion of said second recess with said second pin means and can be unlatched by said translational movement away from said body means and then pivoted from said closed position to a desired open position, with relative movement of said second pin means and said arcuate portion of said second recess, said frictional means retaining said visor means in said desired open position.

4,312,079

FEMUR HEAD CAP FOR ENDOPROSTHESIS

Erhard Dörre, Plochingen; Peter Prüssner, Dietzenbach, and Ludwig Zichner, Neu-Isenburg-Grafenbruch, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 136,087

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914737

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.913 **11 Claims**

1. A femur head cap for an endoprosthesis, having an essentially spherical shape, and a cylindrical recess for partially receiving the femur, said recess being open toward the neck of the femur and the longitudinal axis of the recess extending essentially parallel with the longitudinal center axis of the femur.

4,312,080

MODULAR KNEE FINISHING BLOCK AND METHOD OF FINISHING AN ARTIFICIAL LIMB

Timothy B. Staats, Mission HIlls, Calif., assignor to Regents of University of California, Berkeley, Calif.

Filed Jul. 23, 1980, Ser. No. 171,604

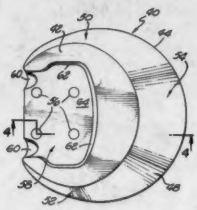
Int. Cl.³ A61F *1/08*

U.S. Cl. 3—2 **26 Claims**

1. A modular finishing block for an artificial limb comprising:

a molded rigid finishing block having an upper surface and a lower surface, a posterior surface, joining the upper and lower surfaces, and a curved tapered surface extending between the upper and lower surfaces and the edges of the posterior surface and forming the medial, lateral and anterior surfaces of the finishing block;

a bracket casting receiving cavity formed in the finishing block and opening in the bottom surface and the posterior surface, and forming a bracket casting receiving surface at the deepest extension of the bracket casting receiving cavity into the finishing block; and



a plurality of spaced apart attachment members contained within the molded rigid material of the finishing block for attaching a bracket casting of a joint mechanism to the finishing block within the bracket casting receiving cavity.

4,312,081

PROSTHETIC JOINTS FOR CRURAL AMPUTEES

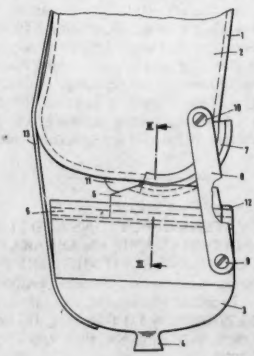
Günter Munny, Wipperfürther Str. 49, 5064 Odenthal-Eikamp, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,160

Claims priority, application Fed. Rep. of Germany, May 19, 1980, 3019048

Int. Cl.³ A61F *1/04, 1/08*

U.S. Cl. 3—22 **9 Claims**



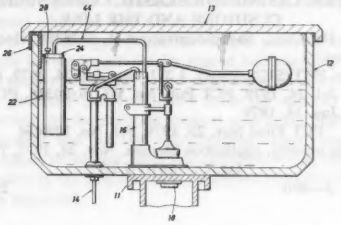
1. A prosthetic joint for crural amputees, comprising a hollow shank, open at the top, for receiving a femoral stump and, articulated to this shank, an insertion member for fitment of a crural prosthesis, characterized by a slide guide rigidly connected to the insertion member, a sliding member displaceable in said guide and having a lower plane surface and an upper arcuate surface, an arcuate slideway fixed to the rear part of the under side of the shank to accommodate the arcuate surface of the sliding member and a pivotal link which connects the rear parts of the shank and the insertion member and effects a forward displacement of the sliding member upon pivotal movement of the insertion member relative to the shank.

4,312,082

DISPENSING APPARATUS FOR TOILETS

John P. Murphy, New Orleans, La., and Jerry G. Kuderna, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1980, Ser. No. 164,480
Int. Cl.[3] E03D 9/02
U.S. Cl. 4—228 4 Claims



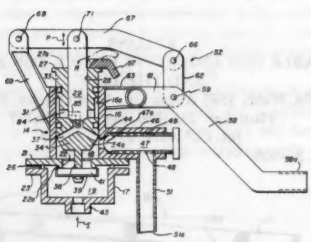
1. A device, containable entirely within the tank of a toilet tank and bowl combination and adapted to dispense a predetermined amount of a liquid formulation into the toilet bowl in response to a cycling water level in the tank during a flushing operation of the toilet, which comprises (a) a liquid reservoir for storage of a supply of the liquid formulation, said reservoir fixedly mountable within the toilet tank, (b) a positive displacement pump having a pumping element reciprocally movable through a pump chamber, valved inlet means in liquid receiving communication with the liquid reservoir, and outlet means in liquid delivering communication with the toilet bowl, (c) a cup-shaped float adapted to ride upright upon the water level in the tank and to move vertically in response to the cycling of this water level, said float having an open top and sealed bottom and peripheral wall which define an interior cavity which nests the reservoir, and (d) coupling means between the pump and the float for transmitting the vertical motion of the float to the pump and thereby reciprocally displacing the pumping element in its working stroke direction through the pump chamber.

4,312,083

WATER CLOSET FLUSH VALVE

Carl E. Imler, 213 W. Kirwin, Salina, Kans. 67401

Filed Aug. 27, 1980, Ser. No. 181,950
Int. Cl.[3] E03D 1/36, 1/06
U.S. Cl. 4—366 12 Claims



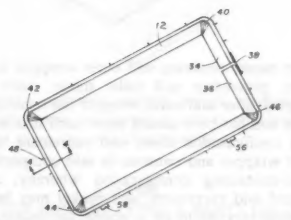
1. In a flush valve for a toilet having a tank and a bowl including a valve housing having upper and lower chambers, a piston and a valve stem slidably disposed in said upper chamber for relative vertical movement, first valve means defined by cooperating surfaces on said valve stem and said piston, a syphon communicating at opposite ends with said tank and said bowl, means for communicating said lower chamber with a source of water under pressure and means for communicating said upper chamber with said tank, float means responsive to the water level in said tank operatively connected to said valve stem, flushing means operatively connected with said piston, second valve means actuated by said piston for communicating said housing lower and upper chambers to permit water introduced into said lower chamber from said source to flow into said upper chamber, means including said first valve means for communicating said upper chamber with said syphon, the improvement which comprises, third valve means actuated by said piston for preventing a reverse flow of water from said upper chamber into said lower chamber upon an interruption in the communication between said source of water and said lower chamber.

4,312,084

INFLATABLE BATHTUB FOR BEDRIDDEN PATIENTS

Robert K. Browning, 4101 Royalview Dr., Knoxville, Tenn. 37921

Filed Nov. 30, 1979, Ser. No. 98,919
Int. Cl.[3] A47K 3/06, 3/14, 3/162
U.S. Cl. 4—538 6 Claims



1. An inflatable portable bathtub suitable for bathing a bedridden patient in traction as the patient remains in bed, comprising:

a water impervious and pliable sheet member, said sheet member suitable for moving under said bedrideen patient as said patient remains in bed and in traction;

a linear inflatable open bottomed rim member having a first and further end and a top portion, said rim member suitable for locating on said bed and being sufficiently deformable for curving around and surrounding said bedridden patient such that said first and further ends are proximate each other, and further including joining means for detachably joining said first and further ends; and

a multiplicity of attaching means, each of said multiplicity of attaching means including a first portion and a second portion, said first portions selectively located and spaced around the peripheral of said sheet member, and said second portions suitable for cooperating with said first portions and secured to said top portion of said rim member, said second portions being selectively located and spaced along said rim member such that said first portions can be joined to said second portions so that when said rim member is inflated, the peripheral portion of said pliable sheet under said bedridden patient, is raised from the surface of said bed thereby providing a water impervious bathtub containing said bedridden patient.

4,312,085

SANITARY WASTE DISPOSAL PACKETS

Bronson M. Potter, R.F.D. 1, Mason, N.H. 03048

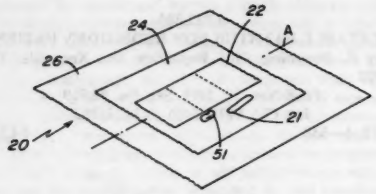
Filed Jan. 18, 1980, Ser. No. 113,245
Int. Cl.[3] A47K 17/00
U.S. Cl. 4—661 14 Claims

1. A mass-producible, compact packet for use in receiving and disposing of solid excrement in a sanitary manner without use of normal sanitation facilities, comprising

a water impermeable outer wrapper systematically closed upon itself to form the exterior of said packet, said outer

wrapper adapted to be opened and used to receive said excrement and to be closed thereabout, said wrapper possessing substantial tensile strength and burst resistance when wet, and in its open laid-flat state being about one foot or longer in each direction, sized to receive all solid excrement from a person discharging excrement from a squatting position, said wrapper being air permeable to admit air to excrement contained in said wrapper through the wall of said wrapper in quantities to promote aerobic bacterial decomposition of said excrement,

a portion of toilet tissue disposed within said packet in a position protected by said outer wrapper, and



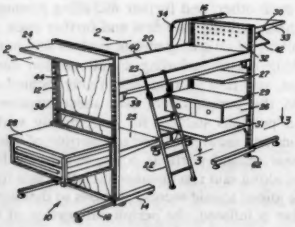
closure means retaining said outer wrapper in its compact form, protecting said toilet tissue, prior to use and adapted, after said outer wrapper has received said excrement and has been closed upon itself in a wrapped compact configuration about said excrement, to retain said used wrapper and contents in said compact used, excrement-containing configuration whereby, after closure around said excrement, said packet may be placed in a location exposed to air to accelerate sanitary decomposition of said excrement while said excrement remains contained by said wrapper, without harm to the environment.

4,312,086

MODULAR FURNITURE

David P. Bianco, York Harbor, Me., assignor to George Nagem, North Hampton, N.H.

Filed Feb. 22, 1980, Ser. No. 123,778
Int. Cl.³ A47B 83/00
U.S. Cl. 5—2 R 8 Claims



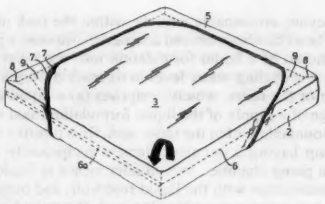
1. A living system comprising at least four spaced, vertically disposed elongated columns arranged in a rectangular orientation to form a frame, each of said columns being supported by a base member, said columns comprising a plurality of vertically spaced longitudinal slots able to receive and secure a plurality of modular furniture components, said components being vertically adjustable on said columns, said living system including a bed mounted on said rectangular frame, said bed including unitary bracket extensions which are inserted into said slots of said columns, said columns having a plurality of sides, said slots being formed on at least two of said sides and at least one side of each of said columns forming an end of said frame containing a longitudinal groove, said living system including a pegboard inserted between at least the pair of columns forming said end, said pegboard supported by said longitudinal groove in each of said columns of said end, said base members comprising telescoping legs which are adjustable horizontally outwardly from said columns, said legs including levelling means to accommodate uneven floor surfaces.

4,312,087

FABRIC CASING FOR ELASTIC CORES SUCH AS CUSHIONS AND THE LIKE

Donald De Geus, Saanehoegsvaegen 4, S-26300 Hoeganaes, Sweden

PCT No. PCT/SE78/00083, § 371 Date Jul. 24, 1979, § 102(e) Date Jul. 24, 1979, PCT Pub. No. WO79/00315, PCT Pub. Date Jun. 14, 1979
PCT Filed Nov. 23, 1978, Ser. No. 109,456
Claims priority, application Sweden, Nov. 24, 1977, 7713315
Int. Cl.³ A47G 9/00
U.S. Cl. 5—490 2 Claims



1. A fabric casing for elastic cores having two faces and a plurality of side surfaces, comprising:

first and second different fabric pieces, each one of said pieces covering one of the faces of said core;

said first and second different fabric pieces being joined together along the entire circumference of said core in a plane halfway distant between said core faces;

said first and second pieces each overlapping the other a distance exceeding said halfway distance between said core faces to thus form a circumferential collar; and

said circumferential collar having a peripheral edge shorter than the circumference of said core,

whereby said collar can be pulled over said either one of said two core faces so as to cover said side surfaces between said faces such that the same one of said first and second different fabric pieces is exposed to view on one of said faces and said side surfaces of said core.

4,312,088

PORTABLE BED ADJUSTING DEVICE FOR PATIENTS AND THE LIKE

Norma M. Webb, 1532 Alison Dr., West Chester, Pa. 19380

Filed Apr. 28, 1980, Ser. No. 144,377
Int. Cl.³ A47C 21/00, 31/00
U.S. Cl. 5—509 12 Claims

1. In a portable kit for inclining a conventional bed for use by a sleeper requiring therapeutic treatment, said bed including a head end, a foot end, plural legs at each end for supporting the bed on a floor, a mattress support and a mattress resting on the mattress support, the combination comprising:

(a) bed elevating means adapted to be inserted under one end of the bed and operable to raise said end to a selected height to incline the bed longitudinally and

(b) mattress retaining means comprising at least one elongated, generally rectilinear member adapted to be inserted between the mattress and the mattress support and to extend longitudinally from the head end to the foot end of the bed, said retaining means being operable to secure the mattress against displacement relative to the mattress support when the bed is inclined,

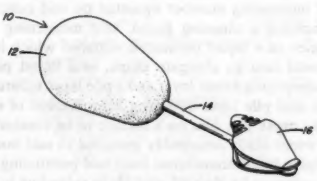
(c) each said elongated member of said mattress retaining means having longitudinally spaced bed engaging means, one said bed engaging means comprising an offset extending generally perpendicularly from the member in the direction of the mattress support and being engageable therewith, and one said bed engaging means comprising an offset extending generally perpendicularly from the member in the direction of the mattress and being engageable therewith.

4,312,089

SWIMMING APPAREL FLOTATION DEVICE

William F. Taylor, 45 Grove St., Essex, Mass. 01929

Filed Dec. 5, 1979, Ser. No. 100,566
Int. Cl.³ B63B *21/52, 51/02*
U.S. Cl. 9—8 R **4 Claims**



1. A device for holding swimming apparel in swimming water comprising:

cellular foam floatation means of ½ to 3 pounds of buoyancy thereby adapted to float said swimming apparel at the surface of a body of water;

clip means for removably attaching said swimming apparel to said floatation means, said clip means having an outwardly opening jaw; and

a unitary plastic arm partially embedded within said floatation means and extending to connect said clip means, said unitary arm providing a rod-like attachment between said floatation means and said clip means;

said clip means comprising a first plate formed as a broadened extension of said unitary arm and a second plate resiliently supported from said first plate and having inwardly facing swimming apparel retaining teeth on ends thereof.

4,312,090

VEHICLE CLEANING APPARATUS

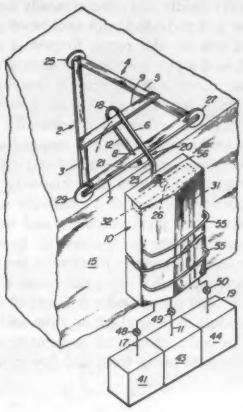
John W. Durcan, 178 Newbrook La., Bay Shore, N.Y. 11706

Filed Apr. 14, 1980, Ser. No. 139,883
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 A **8 Claims**

1. A vehicle cleaning apparatus comprising:

a moveable load carrying member disposed on the roof of a vehicle;

connecting means connected to and suspended downward from said load carrying member; and



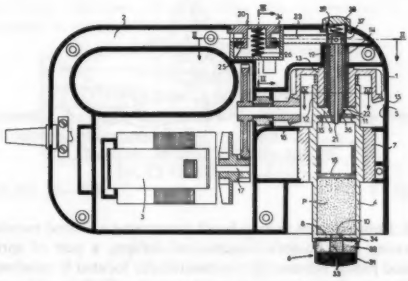
cleaning means, including soaping means, brushing means and rinsing means, connected to said connecting means, suspended along the side of said vehicle.

4,312,091

APPARATUS FOR APPLYING A PASTY OR LIKE PRODUCT BY MEANS OF A ROTARY COATING PAD

Francis Cardus, Domaine Anjoun, Saint-Gilles-les-Bains, Ile de la Reunion, France

Filed Dec. 12, 1979, Ser. No. 102,947
Claims priority, application France, Jan. 4, 1979, 79 00142
Int. Cl.³ A47L *23/06*
U.S. Cl. 15—97 A **6 Claims**



1. An apparatus for applying a pasty or liquid product by means of a coating member comprising a housing; a detachable cartridge carrying the coating member and filled with a product to be applied, said cartridge being mounted in said housing for a rotary movement, and having one end portion connected to the coating member and another end portion; a motor located in said housing; transmission means operatively interconnecting said motor with said cartridge and including reduction gears operating with said motor and a toothed bevel gear operatively connected to said reduction gears; spring means including spring wires mounted on said another end portion and adapted to resiliently retain said cartridge in said housing, said cartridge being formed with a bore; a piston mounted in said bore for slidable reciprocating movement and operative for controllably pushing the product to be applied towards the coating member; a manually-operated pump accommodated in

said housing and operative for supplying pressurized air to said piston; a tubular member fixedly mounted in said housing and adapted for delivering the pressurized air from said pump to said bore; a socket rigidly and concentrically mounted on said tubular member and provided with said bevel gear, said cartridge having a non-circular recess formed at said other end portion thereof, said socket having a projection matching with said non-circular recess and engageable thereby, said tubular member being provided with an external groove, said spring wires surrounding said groove for resiliently retaining said cartridge on said tubular member in a snapped-in engagement, said coating member including an upper portion associated with said cartridge and formed of a relatively rigid material, and a lower portion formed of a relatively soft closed-cell foam-like material, said piston dividing said bore into a first chamber for receiving the pressurized air from said tubular member and a second chamber filled with the product to be applied, said second chamber being associated with the coating member whereby said piston under pressure of the pressurized air urges the product to be applied out from said second chamber; and a seal in said cartridge for preventing any leakage of air pressurized by said pump from said first chamber.

4,312,092

MOP HEADS

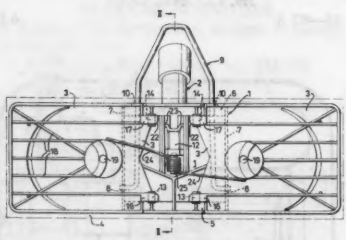
Lars Lundgren, Teleskopgatan 9, S-552 61 Jönköping, Sweden

Filed Jun. 18, 1980, Ser. No. 160,454

Claims priority, application Sweden, Jun. 20, 1979, 7905415

Int. Cl.³ A47L *13/14*

U.S. Cl. 15—119 A **3 Claims**



1. Improvement in mop heads comprising a central member, a swing arm pivotably connected thereto, a pair of spring biased panels substantially symmetrically located in relation to said swing arm, bearing means by means of which said panels are connected to said central member in such a way, that they are pivotable on axes which are substantially parallel to the pivot axis of the swing arm, means for simultaneous rotating the panels in mutually opposite directions, and a water absorbing pad which is secured to said panels in such a way that it is bent and compressed between said panels through simultaneous rotation of the panels towards each other, wherein said central member is provided with a bearing casing in which said swing arm is journaled, and two blocking surfaces are provided on said bearing casing, and a cam surface is provided on each panel for cooperation with and abutment against an individual one of said blocking surfaces, to hereby prevent displacement of said panels in the direction of the pivot axes of said panels during their rotational movement, and wherein a torsion spring, which is common to both of said panels, is journaled on a swing arm stub portion in said central member.

4,312,093

WINDOW CLEANING DEVICE

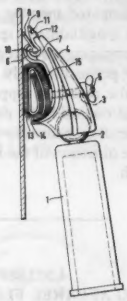
Hans Raab, Birkenallee 9, D-6602 Dudweiler, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,627

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844185

Int. Cl.³ A47L *1/15*

U.S. Cl. 15—121 **10 Claims**



1. A window cleaning device comprising an elongated body member having a concave surface portion extending longitudinally on one side thereof, said surface portion having an edge which extends in the long direction of said body member, an elongated moistening member mounted on said concave portion for holding a cleaning liquid, said moistening member being formed of a liquid permeable material which is convolutely wound into an elongate shape, said liquid permeable material comprising a base layer and a pile layer secured to said base layer, said pile layer including hairs thereon of sufficient hardness to break dirt film on a surface to be cleaned by said device, a wiper blade detachably mounted to said body member for wiping liquid transferred from said moistening member onto the surface to be cleaned, said blade extending in the long direction of said body member, and a handle extending from said body member to enable said moistening member and said wiper blade to be operatively drawn over the surface to be cleaned wherein said edge contacts and forms a partial support for said moistening member to prevent liquid from being discharged downwardly therefrom, thereby increasing the amount of liquid which can be stored by said moistening member.

4,312,094

APPARATUS FOR RAPIDLY COOLING ELONGATED METALLIC PRODUCTS DURING THEIR MOVEMENT IN LONGITUDINAL DIRECTION BY A LIQUID COOLING JET AND FOR REMOVING THE LATTER FROM THE SURFACE OF THE PRODUCT AFTER THE COOLING

Jean-Claude Daverio, 1, rue des Pataljons Ban Saint-Martin, 5700 Metz; Francis Bertolotti, 6 bis avenue des Ecoles, 14460 Colombelles, and Georges Weber, 10, route de Lorry, 5700 Metz, all of France

Filed Dec. 6, 1979, Ser. No. 101,054

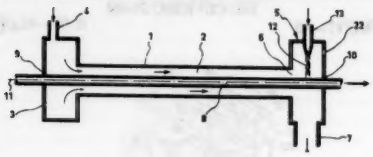
Claims priority, application France, Dec. 26, 1978, 78 36617

Int. Cl.³ B21B *45/02*

U.S. Cl. 15—302 **11 Claims**

1. Apparatus for rapidly cooling elongated metallic products during their movement in longitudinal direction, comprising an elongated tube having an axis and opposite open ends; a box-shaped cooling water feed head communicating with one of said opposite ends of said tube; a box-shaped separator communicating with the other of said opposite ends, said cooling water feed head and said separator being provided in walls

opposite said opposite open ends of said tube with openings aligned with the axis of the tube through which the product to be cooled is adapted to pass to be surrounded by a jet of cooling water during its passage through the tube into said separator; a cooling water outlet at a lower portion of said separator; means in said separator for reducing the thickness of said cooling water jet surrounding the product; and additional means in said separator spaced in direction of said axis from said reducing means for shearing said cooling water jet.

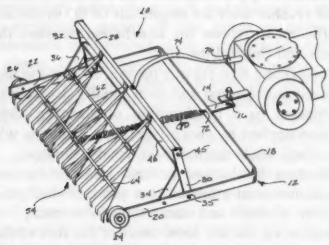


4,312,095

MOBILE LAWN RAKE ATTACHMENT

Harvey L. Mullins, 9610 La-Jolla Dr., Olivette, Mo. 63132

Filed Jun. 4, 1980, Ser. No. 156,395
Int. Cl.[3] A01D *7/02*
U.S. Cl. 56—400.14 **4 Claims**



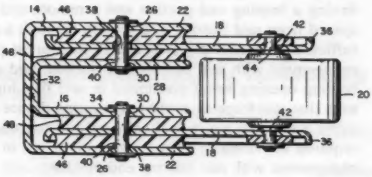
1. A detachable lawn rake device advantageous for use with conventional riding mowers and other similar towing vehicles for gathering and removing lawn clippings, accumulated leaves and other associated lawn debris, said device comprising a wheel frame assembly including a cross frame member having means thereon for coupling to a conventional towing vehicle and side frame members extending rearwardly therefrom, said wheel frame assembly including supporting wheel members mounted on the outside portion of each of said side frame members for rotation thereon, a tine carrying cross-bar member positioned above said wheel frame assembly and supported thereat between a pair of spaced opposed support members rigidly attached to said wheel frame assembly and extending upwardly therefrom, means for pivotally connecting said tine carrying cross-bar member to said pair of spaced opposed support members, a movable rake tine assembly mounted to said pivotal tine carrying cross-bar member for rotational movement therewith between a ground engaging active raking position and an elevated dumping position angularly related thereto, said rake tine assembly including three substantially similar tine sections positioned adjacent to each other and having the center section thereof disposed aft of the two remaining end tine sections located on each side thereof in an overlapping trailing position relative thereto, said center tine section being adaptable to overlap said end tine sections at each end portion thereof, each of said three tine sections including means for separately rigidly attaching said tine sections to said pivotal tine carrying cross-bar member, biasing means for constantly urging said rake tine assembly downwardly into its operative raking position, and readily accessible means manually operable from the seat of the towing vehicle for pivotally raising and lowering the rake tine assembly with respect to a raking surface.

4,312,096

CASTER ASSEMBLY

Dale W. Schubert, Sudbury, and Henry E. Hines, Norwood, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Sep. 7, 1979, Ser. No. 73,277
Int. Cl.[3] A47B *91/00*; B60G *11/34*
U.S. Cl. 16—44 **14 Claims**



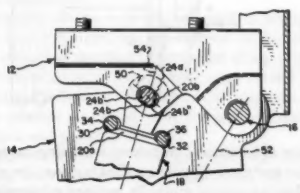
1. A caster assembly comprising: a mounting having a top surface for attachment of the assembly to a structure to be mobilized and spaced parallel side walls extending perpendicular to said top surface; a pair, and not more, of legs extending parallel to and, at a first end, beyond said side walls away from said top surface; a wheel rotatably journaled on said first end of said legs and disposed therebetween; said mounting's side walls and the second end of said legs having spaced parallel confronting surfaces and aligned holes perpendicular thereto; means extending through said holes for pivotally mounting the second end of the legs to said side walls; and elastomeric disks having a first and second side disposed parallel to and between the confronting surfaces and bonded thereto along the entire extent of said first and second sides about said pivotally mounting means wherein said elastomeric disks are elastically deformable in torsion.

4,312,097

COUNTERBALANCE SUPPORT

Kenneth J. Boyd, E. Randolph, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Feb. 26, 1980, Ser. No. 124,797
Int. Cl.[3] E05F *3/04, 3/20*
U.S. Cl. 16—279 **7 Claims**



1. In a combination hinge and counterbalance mechanism for hingedly mounting a cover on a cabinet for vertical swinging movement between horizontally disposed closed and vertically disposed open position, said mechanism including a first hinge part adapted to be attached to one of said cover and said cabinet, a second hinge part adapted to be attached to the other of said cover and said cabinet, hinge pin means for pivotally interconnecting said first and second hinge parts for relative vertical swinging movement, a counterbalance spring device having first and second ends, a first pivot means for connecting

said first end to said first hinge part for pivotal movement relative thereto, and second pivot means for connecting said second end to said second hinge part for pivotal movement relative thereto, said spring device being adapted to exert a force tending to swing said cover vertically about said hinge pin means from said closed position toward said open position, the improvement for selectively disabling said spring device to permit disassembly of said first pivot means, which comprises in combination:

said first pivot means includes a bearing opening in said first end of said spring device, an enlarged bearing opening provided in said first hinge part and a pivot pin sized to be removably inserted within said bearing opening and said enlarged bearing opening, said enlarged bearing opening having a bearing end portion and a remote end portion spaced from said bearing end portion through a distance sufficient to permit displacement of said pivot pin from engagement with said bearing end portion, said enlarged bearing opening being positioned in said first hinge part such that said force exerted by said spring device tends to move said pivot pin in said enlarged bearing opening as required to normally maintain said pivot pin in bearing engagement with said bearing end portion;

said first end of said spring device is provided with a cam surface; and

retaining means removably disposed for engagement by said cam surface and cooperation therewith for releasably retaining said spring device in a partially retracted condition and arranging said bearing opening of said first end in alignment with said enlarged bearing opening intermediate said bearing and remote end portions thereof.

4,312,098

HINGE FOR THE DOORS OF CABINETS OR THE LIKE

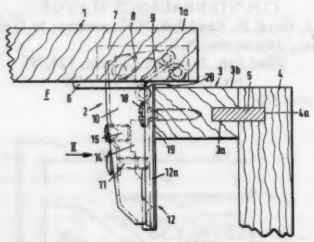
Günter Sundermeier, Bündle, Fed. Rep. of Germany, assignor to Paul Hettich & Co., Kirchlengern, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,155

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 7924808[U]

Int. Cl.³ E05D 7/04

U.S. Cl. 16—240 **10 Claims**



1. A piece of furniture comprising a housing having an open front and an upright wall portion flanking one side of said open front and having several mutually inclined substantially planar surfaces; a movable member having an upright marginal portion adjacent to said wall portion; and at least one hinge pivotally connecting said member to said wall portion so as to permit movements of said member about a substantially vertical axis, said hinge including a support secured to said housing and including several sections each overlying a different planar surface of said wall portion and one of said sections containing a recess also overlying one of said planar surfaces and contiguous to another of said several sections, a first leaf secured to said support, and a second leaf articulately connected to said first leaf and secured to said member.

4,312,099

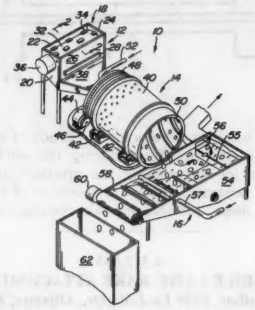
PROCESS FOR SHUCKING A MOLLUSK

Max Cohen, Cape May Court House, N.J., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 916,314, Jun. 16, 1978, Pat. No. 4,198,728. This application Feb. 19, 1980, Ser. No. 122,344

Int. Cl.³ A22C 29/04

U.S. Cl. 17—48 **4 Claims**



1. A process for shucking mollusks comprising:

(a) feeding raw mollusks to a crusher,

(b) introducing a mechanical shock action to the mollusks in said crusher with the magnitude of the shock action being sufficient to release the attachment between the mollusk meat and the mollusk shell,

(c) performing step (b) in a manner so that the mollusks are rapidly accelerated and then rapidly decelerated and are subjected to a combination of shearing and crushing forces applied by two cooperating elements which break the shell while the mollusks are decelerated,

(d) dividing the shucked mollusks into a first stream of loose meat and meat attached to a piece of shell and a second stream of shells and inadvertant loose meat,

(e) separating out the loose meat of the first stream,

(f) recycling the remainder of the first stream as per steps (b) and (c), separating any meat from the shells after the second shock action and adding the separated meat to the meat attained in step (e),

(g) separating the loose meat of the second stream from the shells and adding such loose meat to the meat of step (e).

4,312,100

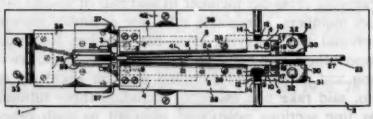
APPARATUS FOR FILLETING FISH

Elmore L. Sink, 1455 Delta Dr., Saginaw, Mich. 48603

Filed Jun. 12, 1980, Ser. No. 158,719

Int. Cl.³ A22C 25/16

U.S. Cl. 17—56 **14 Claims**



1. Apparatus for filleting a dressed fish comprising a base; a pair of substantially parallel mandrel members mounted on said base and spaced by a slot, said mandrel members being adapted to support said fish with its back extending along said slot and its sides upstanding; an extruder blade; and means mounting said blade for movement between the sides of said fish and through said slot in a direction toward said base, such movement of said blade causing the spine of said fish and bones

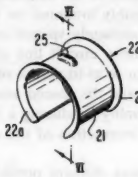
attached thereto to be extruded through the back of said fish and the sides of said fish to be separated from one another.

4,312,101

HOSE CLAMP WITH INSERT MEMBER

Hans Oetiker, Oberdorfstrasse 21, Horgen, Switzerland

Filed Sep. 26, 1978, Ser. No. 945,835
Int. Cl.³ B65D *63/02*
U.S. Cl. 24—20 R **28 Claims**



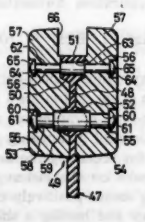
1. An open-ring-like insert member adapted to be assembled on the inside of a hose clamp of the type provided with a band means having a circumferential band portion and with at least one ear means projecting outwardly from the band means and operable to be deformed to tighten thereby the clamp about an object to be fastened, characterized in that the insert member comprises at least one outwardly projecting embossment means which extends generally in the circumferential direction and has external surfaces gradually increasing in height in the radially outward direction from each end thereof so that said outwardly projecting means of the insert member, when placed underneath the opening of an uncontracted ear means of a hose clamp, is operable to be pressed inwardly by the corner portions forming the transitions from the respective ear means into the band portion during deformation of the ear means which causes the corner portions to move toward one another and to thereby engage said external surfaces of the outwardly projecting embossment means with increasing inwardly directed forces in order to prevent the portion of the insert member underneath a respective ear means from escaping outwardly into the opening within the area of the ear means during contraction of the latter and thereby to prevent any leakage place within the area of said ear means.

4,312,102

SEALING SLIDE FASTENER STRINGER

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Filed Mar. 31, 1980, Ser. No. 135,361
Claims priority, application Japan, Apr. 26, 1979, 54-56052[U]
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—205.1 R **10 Claims**



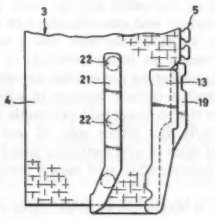
1. A sealing slide fastener stringer comprising:
(a) a stringer tape having a thickened sealing member along a longitudinal edge portion thereof; and
(b) a series of coupling elements mounted on said longitudinal edge portion, each of said coupling elements comprising a pair of members one on each side of said stringer tape and each including a leg disposed on said longitudinal edge portion, a neck disposed on said thickened sealing member, and a coupling head extending beyond said thickened sealing member away from said leg, first connector means extending through said longitudinal edge portion and interconnecting the legs of said members of the coupling element, second connector means extending through said thickened sealing member and interconnecting necks of said members of the coupling element, said coupling heads jointly defining therebetween a slot extending longitudinally along said thickened sealing member, and said thickened sealing member having a surface facing into said slot.

4,312,103

SEPARABLE SLIDE FASTENER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Filed May 30, 1980, Ser. No. 155,003
Claims priority, application Japan, Jun. 21, 1979, 54-85147[U]
Int. Cl.³ A44B *19/36*
U.S. Cl. 24—205.11 F **3 Claims**

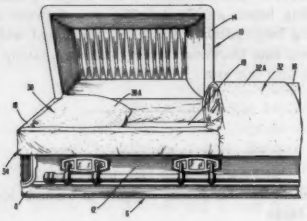


1. A separable slide fastener comprising:
(a) a pair of fastener stringers each including a stringer tape and a row of interlocking fastener elements supported on one side of said stringer tape along an inner longitudinal edge thereof;
(b) a slider threaded on said pair of fastener stringers and slidable along such pair of rows of interlocking fastener elements for coupling and uncoupling the same to close and open said slide fastener;
(c) a pair of reinforcing films each attached to a bottom end portion of one of such two stringer tapes, said each reinforcing film being disposed on said one side of said stringer tape; and
(d) a separable bottom end stop assembly including
(1) a pair of pin members each formed, by injection molding, on one of said fastener stringers along a bottom end portion of an inner longitudinal edge thereof,
(2) means for holding said pair of pin members in collateral relation to couple said fastener stringers at said bottom end portions thereof,
(3) a pair of reinforcing wing members each formed integrally with one of said pin members and extending therefrom so as to overlie an inner marginal portion of one of said reinforcing films, said each wing member having an outer edge extending substantially parallel to said one of said pin members and disposed slightly outwardly of an outermost side edge of said slider, and
(4) a pair of ribs each disposed on the other side of said one of said stringer tapes and connected to said one of said reinforcing wing members by a plurality of bridges extending through said one of said reinforcing films and said one of said stringer tapes.

4,312,104
CONVERTIBLE INTERIOR UPHOLSTERY FOR A BURIAL CASKET

Juanita Baker, Metamora, and Keith E. Miller, Batesville, both of Ind., assignors to Batesville Casket Company, Inc., Batesville, Ind.

Filed May 14, 1980, Ser. No. 149,933
Int. Cl.³ A61G *17/00*
U.S. Cl. 27—19 **10 Claims**



1. A big body for use in overlying the container rim of a casket, said big body comprising:

a plurality of separate panels mountable to the container such that an inner panel is disposed inside the container and presents an exposable side, an outer panel hangs outside the container and overlies the rim of the container and presents an exposable side, and a swinging panel is movable between an inside position in which it hangs inside the container to cover said exposable side of said inner panel and an outside position in which it hangs over the container rim to cover said exposable side of said outer panel and such that either side of said swing panel is exposed, said sides of said swinging panel having different ornamental appearances, said panels being mutually positionable in:

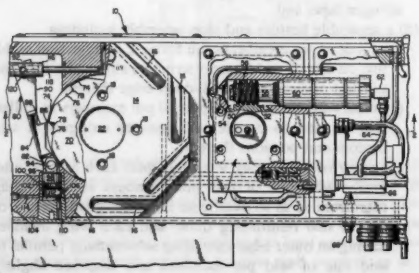
a first mode wherein the exposed sides of the inside and outside panels have a first ornamental appearance, and

a second mode wherein the exposed sides of the inside and outside panels have a second, different ornamental appearance.

4,312,105
PROGRAMMABLE TURRET-TYPE MACHINE TOOL

Ivan R. Brown, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Continuation of Ser. No. 919,926, Jun. 28, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 141,936
Int. Cl.³ B23Q *15/26*
U.S. Cl. 29—39 **8 Claims**



1. A programmable turret type machine tool, comprising:

(a) a machine tool base having a turret assembly including a machine tool turret which is rotatably mounted on the base and has a plurality of spaced machine tools,

(b) the turret assembly including a machine tool turret rotating means which is connected to the turret for rotating it so that the spaced turret machine tools are successively rotated to a work station position,

(c) a gear train having an input element rotatably connected to the machine tool turret assembly and having an output shaft the rotation of which accurately reflects the amount of machine tool turret rotation,

(d) a rotor which acts as an element in a sensing circuit and is fixedly mounted on the gear train output shaft being rotatable therewith at a fixed angular correlation with respect to the rotation of the machine tool turret,

(e) an encoding assembly mounted on the base and which has a plurality of arcuately spaced sensing elements disposed in a plane on a circuit line adjacent the path of rotation of the rotor so as to permit successive interaction between the rotor and the spaced sensing elements,

(f) the encoding assembly producing a different coded output signal for the interaction of the rotor with different sensing elements,

(g) each spaced sensing element positioned to correspond with a given work station and to provide a lead angle with respect to the actual position of the corresponding turret machine tool to give a brief time interval in which the control elements can function before arrival of the machine tool at the work station,

(h) program means for controlling machine tool work station selection by providing a series of coded output signals which correlates with the codes produced by the encoding assembly,

and

(i) comparator means connected to the program means and to the encoding assembly for receiving the coded signals, and having an output line connected to the turret assembly for producing a turret assembly control signal when the received code from the encoding assembly unit correlates with the coded signal from the program means for a given desired work station.

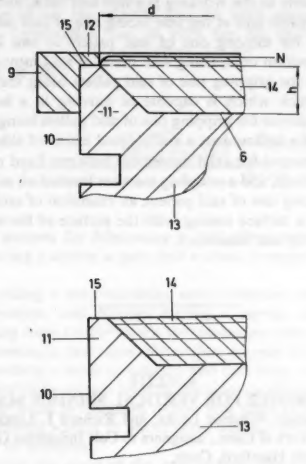
4,312,106
PROCESS FOR APPLYING A HEAT-BARRIER LAYER TO A PISTON CROWN

Hans Wanner, Herisau, and Kurt Boppart, St. Gallen, both of Switzerland, assignors to Fritz Haug AG, St. Gallen, Switzerland

Filed Jan. 25, 1980, Ser. No. 115,779
Claims priority, application Switzerland, Mar. 15, 1979, 2449/79
Int. Cl.³ B23P *15/10*
U.S. Cl. 29—156.5 R **4 Claims**

1. A process for applying a heat-barrier layer of plastic material to the crown of the piston for a piston-type machine, in particular a piston-type compressor, said piston having a circumferential outside wall comprising providing the piston crown with a recess for receiving the heat-barrier layer, disposing a pouring means on the piston crown in a vertical position, said pouring means positively embracing the piston crown at its periphery and having a shoulder extending inwardly from the circumferential outside wall of the piston at least to the recess so as to form a container-like configuration circumscribing said recess, filling the recess in the piston crown with a liquid plastic material which undergoes a reduction in volume when it solidifies, continuing said filling until

the level of the pouring material, whose radial spread is restricted by the pouring means, is higher than the upper edge of

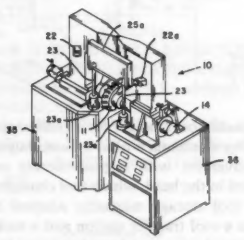


the piston crown before the material solidifies, and removing said pouring means after the pouring material has solidified.

4,312,107
AUTOMATIC ARCUATE BRAKE SHOE RIVETING MACHINE AND METHOD

Edward M. White, Milford, Conn., assignor to The Milford Rivet & Machine Co., Milford, Conn.

Filed Dec. 26, 1979, Ser. No. 106,782
Int. Cl.³ B23P *15/18*; B21J *15/14*
U.S. Cl. 29—233 **22 Claims**

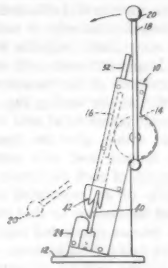


1. An apparatus for loading, positioning and riveting arcuate brake shoe components comprising a base plate and friction pad, comprising an anvil fixture carrying a plurality of radially-extending anvil elements, each anvil element comprising a rivet-setting end and a depressible alignment pin, the rivet-setting ends of said anvil elements defining a segmented arcuate surface adapted to receive said brake shoe components for assembly, said anvil elements being aligned on said anvil fixture so that when the alignment pin of the leading anvil element is inserted into the leading pair of aligned holes in a plate and pad to be assembled, the alignment pins of successive anvil elements will be aligned with and enter the successive aligned holes of the plate and pad when said plate and pad are pushed into engagement with said segmented arcuate surface, thereby locking said plate and pad onto said anvil fixture, means for rotating said anvil fixture, at least one riveting machine having a riveting head in the path of rotation of said fixture, means for relatively rotating said fixture to bring each said anvil element into riveting position beneath said riveting head, and means for actuating the riveting machine to cause an upset rivet to be positioned and set in the aligned holes of a plate and pad mounted on said anvil fixture.

4,312,108
CLIPPING DEVICE

Maynard J. G. Tipper, Oakland, Calif. 94010

Filed Oct. 17, 1980, Ser. No. 197,830
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.56 **2 Claims**



1. In a clipping device for applying a U-shaped clip to an article of deformable material:

a frame formed with an elongated track,

an elongated punch slidably received in said track,

a die fixedly secured to said frame at one end of said track,

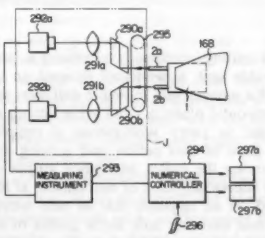
said frame being formed with a throat terminating at said die and adapted to receive such article therein, for positioning said article at said die, and

a gathering plate carried directly by said punch and formed with an outwardly diverging recess means to receive said article therein for gathering and compressing the same to a relatively small cross sectional area upon movement of said punch toward said die.

4,312,109
APPARATUS FOR INSERTING ELECTRONIC ELEMENTS

Takeshi Kawana; Toshiaki Murai, both of Yokohama, and Naoyuki Sakurai, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,655
Claims priority, application Japan, Feb. 25, 1980, 55-21684
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—564.6 **10 Claims**



1. An apparatus for inserting electronic elements, comprising:

(a) means for supplying electronic elements;

(b) means for cutting to different lengths a plurality of lead wires extended in the same direction from the body of an electronic element supplied from said electronic element supply means;

(c) an insertion head including (A) a chuck mechanism for holding the body of an electronic element with the lead wires thereof cut to different lengths by said cutting means and (B) an insertion mechanism for moving said chuck mechanism vertically along the extension of said lead wires with respect to a printed circuit board;

(d) means for measuring the position of the forward end of each of said lead wires along the X and Y axes of the surface of said printed circuit board, said lead wires being held by said chuck mechanism of said insertion head;

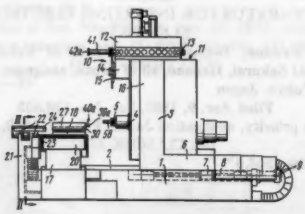
(e) positioning means for moving said electronic element and said printed circuit board relatively to each other along the X and Y axes in accordance with the positions of the forward ends of the lead wires measured by said measuring means and the positions of the insertion holes of said printed circuit board, thereby setting the centers of the lead wires to the center positions of said insertion holes; and (f) control means which, after the center axis of the forward end of the longest lead wire among said lead wires of different lengths of each electronic element is set to the center position of an associated insertion hole, actuates said insertion mechanism so that only the longest lead wire is inserted into an associated insertion hole, the next longest lead wire being held without contacting the substrate, followed by the process of setting the center axis of the forward end of said next longest lead wire to the center position of an associated insertion hole, said next longest lead wire being then inserted into said insertion hole, thus sequentially inserting the forward ends of said plurality of lead wires into the associated insertion holes respectively.

4,312,110

AUTOMATIC PALLET-CHANGING METAL-CUTTING MACHINE

Oleg I. Averyanov, Leninsky prospekt, 79, kv. 178, and Leonid M. Kordysh, Baikalskaya ulitsa, 26, kv. 251, both of Moscow, U.S.S.R.

Filed Dec. 28, 1978, Ser. No. 974,080
Int. Cl.³ B23Q *3/157, 41/02;* B65G *67/00*
U.S. Cl. 29—568 **6 Claims**



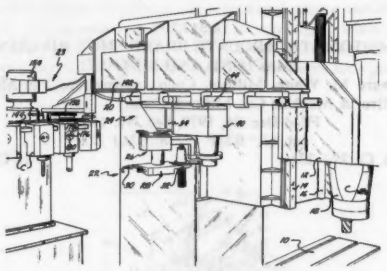
1. A metal-cutting machine, comprising a bed; bed slideways; a movable unit; a headstock located on said movable unit; a drive for moving said movable unit over said bed slideways in a horizontal plane; a work table having stock guides; pallets adapted to carry workpieces; a coupling member mounted on each of said pallets and serving as connecting means for moving the pallet, said stock guides of said work table slidably supporting each of said pallets; at least one platform installed on an opposed side of said work table with reference to said movable unit; stock guides of said platform adapted for slidably supporting each of said pallets, said platform and work table including means for moving said platform and work table relative to each other in a horizontal plane so that when each of said pallets is in the position of moving to the working position and back said stock guides of the platform serve as a continuation of said stock guides of the work table; a device for gripping one of said pallets when the latter moves over said stock guides of the platform and said stock guides of the work table to the working position and back, and located on said movable unit at the side facing one of said pallets, the drive used for moving one of said pallets to and from the working position comprising said drive of said movable unit, said device for gripping one of said pallets being installed on said headstock which is capable of moving in a horizontal plane, said device for gripping one of said pallets being made in the form of a hollow bar, a rod located inside of side hollow bar and arranged for axial movement between fixed predetermined positions, and a coupling member located on said rod at the side facing one of said pallets, an extension of said hollow bar having a surface mating with the surface of the socket of the spindle of said headstock.

4,312,111

TOOL CHANGER FOR VERTICAL SPINDLE MACHINE

Adolf E. Peiser, Windsor Locks, and Richard I. Latzko, Glastonbury, both of Conn., assignors to Colt Industries Operating Corp, West Hartford, Conn.

Filed Aug. 17, 1979, Ser. No. 67,240
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **9 Claims**



1. In an automatic tool changer for a vertical spindle machining center having a column, a head mounted upon the column for vertical movement with respect thereto and a vertical spindle journaled in the head, which tool changer is of the type comprising: a tool storage magazine adapted to selectively present tools to a tool transfer station and a tool transfer arm having a pair of tool grippers adapted to grasp tools at the tool transfer station and the spindle, the improvement comprising:

a slide assembly mounted upon a side of the column for sliding movement between a rearward position adjacent the tool transfer station and a forward position adjacent the spindle;

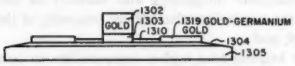
a transfer arm support mounted upon the slide assembly for pivoting movement with respect thereto, the slide assembly including a mechanism for respectively imparting oppositely directed pivoting movements to the transfer arm support during forward and rearward movement of the slide assembly, the tool transfer arm being mounted upon the transfer arm support for rotation with respect thereto between two index positions about an axis spaced from and parallel to the axis of pivoting of the transfer arm support, the transfer arm support being of a sufficient length and pivotable through a sufficient angle to permit a gripper to grasp a tool in the spindle when the slide assembly is in forward position.

4,312,112

METHOD OF MAKING FIELD-EFFECT TRANSISTORS WITH MICRON AND SUBMICRON GATE LENGTHS

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 953,959, Oct. 23, 1978, abandoned. This application Nov. 29, 1979, Ser. No. 98,710
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—571 3 Claims



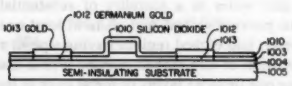
1. A process for fabricating a field-effect transistor of the type having a source, a gate, and a drain, comprising the steps of:
(a) providing a semi-insulating semiconductor substrate with an N-layer, said N-layer having a carrier concentration ranging from 1×10^{16} to 4×10^{18} atoms per cubic centimeter,
(b) depositing a first layer of tantalum on said N-doped layer,
(c) depositing a layer of gold on said first layer of tantalum,
(d) depositing a second layer of tantalum on the gold, approximately equal in thickness to said first layer of tantalum,
(e) depositing a layer of photo resist material over the second layer of tantalum,
(f) defining the areas of the gate and the drain in the photo resist material by photolithographic means,
(g) removing the second tantalum layer except for the area of the gate and the drain,
(h) removing the photo resist over the gate and drain,
(i) removing the gold not protected by the remaining second tantalum layer over the gate and drain areas,
(j) removing the first tantalum not protected by the remaining gold over the gate and drain areas,
(k) removing the remaining second tantalum layer simultaneously with the removal of the first tantalum layer in step (j), and
(l) forming an ohmic contact to the N-layer to provide the source electrode.

4,312,113

METHOD OF MAKING FIELD-EFFECT TRANSISTORS WITH MICRON AND SUBMICRON GATE LENGTHS

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 953,957, Oct. 23, 1978, abandoned. This application Nov. 29, 1979, Ser. No. 98,802
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—571 1 Claim



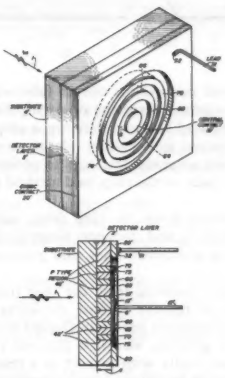
1. A process for fabricating a metal-oxide semiconductor junction comprising the steps of:
(a) providing an N-type semiconductor semi-insulating substrate with an N-layer having a carrier concentration in the range of 1×10^{16} to 4×10^{18} atoms per cubic centimeter,
(b) depositing a layer of tantalum on the N-layer,
(c) depositing a layer of gold on the tantalum layer,
(d) defining the source and drain area by photolithographic means,
(e) removing the gold in areas not defined as the source and drain junction areas,
(f) reducing the thickness of the tantalum layer outside the source and drain junction areas,
(g) oxidizing the total exposed tantalum layer completely,
(h) depositing a layer of photo resist,
(i) defining the gate area by photolithographic means,
(j) removing the photo resist in the gate area,
(k) depositing a layer of gold, and
(l) removing the photo resist and the gold away from the gate, leaving only a layer of gold over the gate area.

4,312,114

METHOD OF PREPARING A THIN-FILM, SINGLE-CRYSTAL PHOTOVOLTAIC DETECTOR

Richard B. Schoolar, Westminster, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 918,133, Jun. 22, 1978, Pat. No. 4,157,926, which is a division of Ser. No. 771,717, Feb. 24, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,236
Int. Cl.³ H01L *21/363, 27/14*
U.S. Cl. 29—572 19 Claims

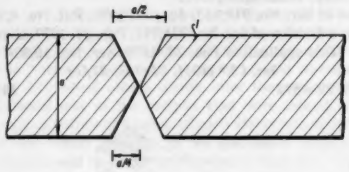


1. A method of preparing a thin-film, single-crystal photovoltaic detector which comprises:
selecting a substrate which is an electrically insulating single crystal and is transparent to the radiation to be detected;
vapor-depositing an epitaxial layer of a semiconductor with an N- or P-type conductivity on said substrate at a thickness such that a metallic non-ohmic contact on said epitaxial layer, said non-ohmic contact having a conductivity opposite in type to that of said epitaxial layer could induce a region with a conductivity type opposite to that of said epitaxial layer, said region extruding from said non-ohmic contact to said substrate;
depositing a metallic non-ohmic contact, having a conductivity type opposite to that of said epitaxial layer on the surface of said epitaxial layer opposite to the surface of said epitaxial layer in contact with said substrate at a location interior on the surface, said contact having a two-dimensional geometric configuration wherein at least one dimension does not exceed twice the diffusion length of a minority-charge carrier in said region induced by said non-ohmic contact; and
depositing at least one metallic ohmic contact on the surface of said epitaxial layer on which said non-ohmic contact has been deposited in such configuration that a substantially annular space is formed around said non-ohmic contact, said annular space having a width at least equal to the diffusion length of a minority-charge carrier in said epitaxial layer.

4,312,115
PROCESS TO OBTAIN MULTIELEMENT LINEAR BIDIMENSIONAL INFRARED DETECTORS HAVING IMPROVED EXACTNESS OF GEOMETRY AND HIGH DEGREE OF INTEGRATION

Heinz Diedrich, Via Lipari, 44, Rome, Italy (00141); Marco Fazi, Via M. Fascetti, 26, Rome, Italy (00136); Domenico Fanti, Via Leopardi, 51, Bagni Di Tivoli (Rome), Italy (00011); Angelo Mercuri, Via S.M. Ausiliatrice, 67, and Romolo Tranquilli, Via Eurialo, 14, both of Rome, Italy (00181)

Continuation of Ser. No. 860,228, Dec. 13, 1977, abandoned.
This application Feb. 12, 1980, Ser. No. 120,748
Claims priority, application Italy, Dec. 14, 1976, 52606 A/76
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 **7 Claims**



1. An improved method for use in fabricating individual semiconductor radiation detectors on a chip having first and second major opposed surfaces defining a chip thickness dimension therebetween, said method relating to minimizing the separation between adjacent detectors to optimize the utilization of available space on the chip, said method comprising the steps of:

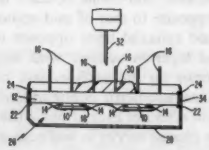
removing material from the chip from said first surface inward relative to said thickness dimension to define first grooves along prescribed lines, said grooves having sloping sides;

removing further material from the chip from said second surface inward relative to said thickness dimension to define second grooves generally aligned with and contacting said first grooves, said first grooves each being disposed symmetrically with respect to a respective second groove about an imaginary plane extending through said chip parallel to said first and second surfaces.

4,312,116
METHOD OF SEALING AN ELECTRONIC MODULE IN A CAP

Floyd R. Moser, South Burlington, and Richard W. Noth, Underhill, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,266
Int. Cl.³ H01L *1/10*
U.S. Cl. 29—588 **7 Claims**



1. In the packaging of a module comprising at least one silicon chip mounted on a ceramic substrate, wherein a silicone polymer has been applied around each chip on the substrate and has been cured, and said packaging includes the step of mounting said module in a cap member wherein the cap member encloses said module around the edges thereof with the chips directed inwardly and the back surface of the module being exposed outwardly, the improvement which comprises,

applying an epoxy to said exposed back surface of said module, said epoxy being dispensed at a first temperature at which the epoxy flows to seal around the edges of said module and said cap;

thereafter, heating the module and cap with the applied epoxy to a second temperature and maintaining said second temperature until said epoxy gels, said second temperature and rate of heating being selected to allow essentially complete outgassing and stability of the pressure within the cap before the critical viscosity of the epoxy is attained; and

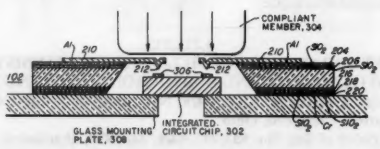
thereafter heating to a higher temperature to complete the cure;

said process being further characterized by preventing any decrease in temperature subsequent to the dispensing and flow of the epoxy and prior to the attaining of the gel point.

4,312,117
INTEGRATED TEST AND ASSEMBLY DEVICE

David R. Robillard, Westboro, and Robert L. Michals, Marlboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 829,770, Sep. 1, 1977, Pat. No. 4,189,825, which is a division of Ser. No. 666,826, Mar. 15, 1976, Pat. No. 4,096,348, and Ser. No. 583,739, Jun. 4, 1975, Pat. No. 3,984,620. This application Nov. 20, 1979, Ser. No. 96,118
The portion of the term of this patent subsequent to Feb. 26, 1997, has been disclaimed.
Int. Cl.³ H01L *21/603*
U.S. Cl. 29—589 **5 Claims**



1. The method comprising the steps of:

providing a substantially planar wafer of substantially (100) oriented silicon;

etching said wafer in a plurality of substantially circular areas to provide etched regions in at least one surface of said wafer, said etched regions having a point at the innermost portion of said etched regions within said wafer;

depositing one or more layers of metal over at least portions of said surface of said wafer, said metal filling at least the inner portions of said etched regions thereby forming pointed tips;

etching away portions of said wafer surrounding and under said pointed tips to leave one or more apertures in said wafer to form leads having ends terminating in said pointed tips;

providing one or more integrated circuit chips, each one of said chips having a plurality of conductive bonding pads;

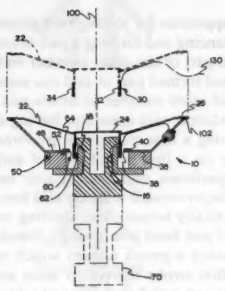
positioning said chips in said apertures by aligning said pointed tips with said bonding pads; and

applying pressure to said ends of said leads to cause said pointed tips to make electrical contact with said pointing pads.

4,312,118
METHOD FOR PRODUCING SPEAKER CONSTRUCTION

John D. Saik, Brownsville, Tex., and Jack A. English, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Mar. 28, 1980, Ser. No. 134,927
Int. Cl.³ H04R *31/00*
U.S. Cl. 29—594 **10 Claims**

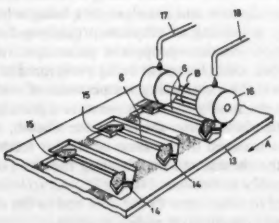


1. A method for constructing a loudspeaker comprising the steps of forming a one-piece diaphragm and dust cover member, joining to said member a bobbin and winding forming a voice coil, disposing the combination member and voice coil in relation to an air gap formed between a central portion of a metal housing mounted on a permanent magnet and a centrally disposed upwardly projecting integral post of a base plate upon which is mounted said magnet, thereafter precisely locating the voice coil within the air gap by inserting a gauge from the rear of said base plate through said post and into position defining relation with the interior surface of said bobbin, permanently fixing the adjusted position of said coil relative to said gap by securing the outer periphery of said diaphragm and dust cover member to an enlarged diameter section of the metal housing, and thereafter withdrawing said gauge.

4,312,119
METHOD OF MANUFACTURING STATORS FOR STEPPING MOTORS

Norberto Perucchi, St. Blaise, and Elmar Mock, Bienne, both of Switzerland, assignors to Eta A.G. Ebauches-Fabrik, Grenchen, Switzerland

Filed Feb. 25, 1980, Ser. No. 124,275
Claims priority, application Switzerland, Feb. 27, 1979, 1931/79
Int. Cl.³ H02K *15/08*
U.S. Cl. 29—596 **6 Claims**



1. A method of manufacturing stators for stepping motors of electronic watches, wherein the improvement comprises the steps of:

partially blanking from a strip of ferromagnetic metal coil cores each having an elongated center portion and widened end portions,

depositing a mask on the marginal zones of one face of said strip in such a way as to cover said widened portions,

forming thin, adherent, insulating films of resin on the non-masked portions of said strip by electrophoresis,

removing said mask,

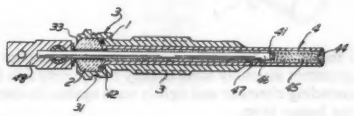
completing said blanking, and

forming coils by winding insulated wire over said insulating films along each said center portion of said cores.

4,312,120
GLOW PLUG MANUFACTURE

Richard L. Comer, Findlay, Ohio, assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed May 22, 1980, Ser. No. 152,242
Int. Cl.³ H01C *17/02*
U.S. Cl. 29—611 **5 Claims**



1. A method of forming a gas tight seal for a glow plug of the type having an annular gasket, a tubular insulator, a tubular metal shell, and a heater assembly including an outer metal tube having a closed end and an opposite open end, the method comprising:

flaring one end of the metal tube;

forming an annular groove on the outside of said shell;

forming an annular shoulder inside said shell adjacent said groove;

placing the annular gasket inside said shell with one side of said gasket against the shoulder in said shell;

placing a portion of said heater assembly into said shell with the closed end of said tube extending from one end of said shell;

locating one side of the flared end of said tube against the opposite side of said gasket;

placing said insulator into said shell with one end of said insulator against the opposite side of the flared end of said tube;

forming the other end of said shell against the other end of said insulator to captivate said insulator, gasket, and flared end of said tube inside said shell; and

applying pressure to said other end of said shell to press said insulator, gasket, flared end of said tube and said shoulder against each other while simultaneously passing an electrical current through said shell to heat said shell until the metal around the groove softens, whereby when said electrical current is removed and said shell cools, said shell contracts to form a pressure tight seal between said insulator, tube, gasket and shell.

4,312,121
CONNECTION SYSTEM FOR HEATER STRIPS

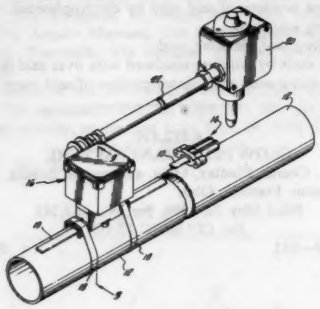
Donald G. Tweed, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 26, 1979, Ser. No. 6,772
Int. Cl.³ H01C *1/022*; H02G *3/18*
U.S. Cl. 29—611 **24 Claims**

1. An apparatus for electrically terminating at least two heater strips located on a support surface comprising:

(a) a deformable, electrically non-conductive grommet assembly for each heater strip, each grommet assembly being sized to fit circumferentially around one of the heater strips, each grommet assembly being oriented so as to hold an end of a heater strip away from the support surface;

(b) chambers in a side by side relationship, one chamber for each grommet assembly, each chamber supporting and substantially completely surrounding a grommet assembly; and



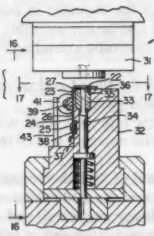
(c) means for deforming the grommet assemblies so each grommet assembly substantially completely fills its corresponding chamber and tightly seals against its corresponding heater strip.

4,312,122

APPARATUS AND METHOD FOR FORMING AN ELECTRICAL SWITCH ASSEMBLY

James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 8, 1979, Ser. No. 64,724
Int. Cl.³ H01H *11/00*; B23P *11/00*
U.S. Cl. 29—622 **20 Claims**



1. In a method of making an apparatus for joining two abutting metal members together by lancing and forming a part of one member through an unblanked part of the other member and thereafter staking said lanced and formed part of said one member to an adjacent surface of said other member to secure said members together in abutting relation with an apparatus that has a single reciprocating head having a first means that performs said lancing and forming step on a first stroke thereof and having a second means that performs said staking step on a second stroke thereof, the improvement comprising the steps of disposing said head to reciprocate substantially vertically beneath said abutting metal members, forming said first means of said head with a female die member, providing said apparatus with a punch toward which said head is moved during said first stroke thereof to lance and form said metal members between said female die and said punch, forming said second means of said head with an anvil member adapted to reciprocate in said female die member whereby said anvil member is adapted to compact said lanced and formed parts of said metal members between said anvil member and said punch during said second stroke of said head to perform said staking step, said one member comprising an electrical terminal and said other member comprising a switch blade whereby said secured together members comprise a switch blade assembly, said switch blade being substantially L-shaped and thereby having two legs disposed substantially at a right angle relative to each other with said terminal member to be secured to one of said legs, forming said head with a top means for receiving said one leg of each switch blade thereon and with a side means against which the other of said legs of the respective switch blade can be disposed, and holding said other leg of said respective switch blade against said side means of said head with an arm means.

11. In an apparatus for joining two abutting metal members together by lancing and forming a part of one member through an unblanked part of the other member and thereafter staking said lanced and formed part of said one member to an adjacent surface of said other member to secure said members together in abutting relation, said apparatus having a single reciprocating head having a first means that performs said lancing and forming step on a first stroke thereof and having a second means that performs said staking step on a second stroke thereof, the improvement wherein said head reciprocates substantially vertically beneath said abutting metal members, said first means of said head comprising a female die member, said apparatus having a punch toward which said head is moved during said first stroke thereof to lance and form said metal members between said female die and said punch, said second means of said head comprising an anvil member adapted to reciprocate in said female die member, said anvil member being adapted to compact said lanced and formed parts of said metal members between said anvil member and said punch during said second stroke of said head to perform said staking step, said one member comprising an electrical terminal and said other member comprises a switch blade whereby said secured together members comprise a switch blade assembly, said switch blade being substantially L-shaped and thereby having two legs disposed substantially at a right angle relative to each other with said terminal member to be secured to one of said legs, said head having top means for receiving said one leg of each switch blade thereon and having a side means against which the other of said legs of the respective switch blade can be disposed, said apparatus having arm means for holding said other leg of said respective switch blade against said side means of said head.

4,312,123

METHODS OF MAKING HIGH VOLTAGE ELECTRICAL INSULATORS AND OIL-LESS BUSHINGS

Edward S. Wheeler, Batavia, N.Y., assignor to Interpace Corporation, Parsippany, N.J.

Filed Mar. 12, 1979, Ser. No. 19,849
Int. Cl.³ H01B *19/00, 17/02, 17/28*
U.S. Cl. 29—631 **11 Claims**

2. A method of making a conductive insulated oil-less bushing, said method comprising steps as follows:

placing a sheath of an essentially completely unvulcanized elastomer on a core, the core being a conductive rod with a covering thereon and the elastomer being selected from the group consisting of ethylene-propylene-diene monomer rubber, ethylene-propylene monomer rubber and butyl rubber, said placement being performed at a temperature below the vulcanizing temperature of said sheath,

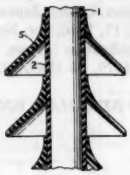
mounting at essentially room temperature a plurality of fully vulcanized elastomeric sheds on the sheath, the sheds being of a material of the same or similar formulation as used for the sheath, and then heating the core, sheath and shed assembly to between 140° to 200° C. to vulcanize the sheath and to bond same to the core and to the sheds so as to form said conductive oil-less bushing.

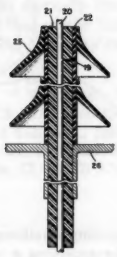
6. A method of making a high voltage resistant integrated member, said method comprising steps as follows:

extruding a sheath of an essentially completely unvulcanized elastomer on a core; said extrusion being performed at a temperature below the vulcanizing temperature of the

elastomer, the elastomer being selected from a group consisting of ethylene-propylene-diene monomer rubber, ethylene-propylene monomer rubber and butyl rubber,

mounting at essentially room temperature at least one fully vulcanized elastomeric shed on the sheath, the shed being





fabricated from a material of the same or similar elastomer formulation as used for the sheath, and

then heating the core, shed and the sheath assembly to between 140° to 200° C. to vulcanize the sheath and bond same to the core and to the shed so as to form said high voltage resistant member.

4,312,124

MULTIPLE TUBE PULLING APPARATUS

Gregory L. Calhoun, Lutz, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 27, 1979, Ser. No. 97,771
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—726 **8 Claims**

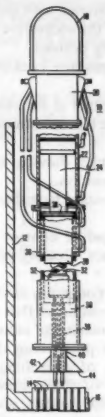
1. Apparatus for removing a plurality of tube stubs from a tubesheet comprising:

a first member having a stationarily mounted casing supporting a first reciprocally mounted piston for movement in the direction of the axes of said tube stubs between a retracted and non-retracted position;

a second member attached to said first reciprocal piston and defining a second casing supporting a second reciprocally mounted piston for movement in the direction of the axes of said tube stubs between a retracted and non-retracted position;

a plurality of tube-gripping members, and means for supporting said gripping members from said first piston coaxial with a like plurality of said tube stubs, said gripping members defining generally cylindrical tubes having an outer diameter less than the inner diameter of said tube stubs and having axially extending slits, open at the free end, to permit radially outward expansion of said tube-gripping members;

a plurality of tube expanding rod members and means for commonly supporting said rod members from said second piston, with each rod member extending axially through an associated tube-gripping member and having an outwardly tapered free end projecting from the free end of said tube-gripping member when said second piston is in a non-retracted position for expanding said tube-gripping member into gripping engagement within said stub tubes as said tapered end is retracted into said tube gripping members in response to said second piston being moved to said retracted position;



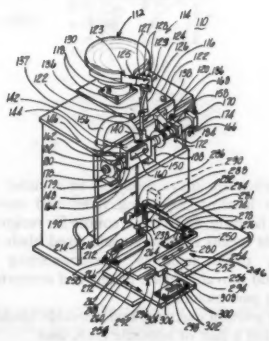
whereby, once said gripping engagement between said plurality of said tube-gripping members and said stub tubes is properly established, said first piston is moved to a retracted position to remove said stub tubes from said tubesheet.

4,312,125

METHOD AND APPARATUS FOR AUTOMATICALLY INSERTING AN ELECTRICAL CONTACT INTO AN ELECTRICAL CONNECTOR

Robert D. Waghorn, Oneonta, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 3, 1979, Ser. No. 99,776
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—884 **1 Claim**



1. A method of inserting successive electrical contacts into succesive connector cavities formed in a connector, the contacts each being of the type having a stem-like tail portion heavier than an enlarged forward position, the steps of the method comprising:

providing a housing of the type having a first passage, a second passage spaced from the first passage and extending through the housing and a slide member having a third passage, each of said passages being vertically disposed with said slide member being mounted for reciprocating

the third passage transversely of said passages and between the first and second passages, the first passage representing a contact receiving position, the second passage representing a contact releasing position and the third passage sized to communicate a contact between the passages when registered with either,

registering the first of the successive connector cavities with the contact releasing position,

positioning the third passage so as to be in register with the first passage,

receiving the first contact at the contact receiving position whereby the contact is communicated to the third passage,

sliding the slide member having the first contact to the contact releasing position,

propelling the first contact from the contact releasing position,

guiding the first propelled contact along a predetermined path from the contact releasing position to the first cavity of the connector,

advancing the second connector cavity into register with the contact releasing position so that the predetermined path for each contact remains the same,

repeating the steps of positioning the third passage, of receiving, of sliding, of propelling, of advancing and of guiding successive of the contacts along the predetermined path from the contact receiving position to the cavity of the connector.

4,312,126
RECIPROCALLY DRIVING MEANS

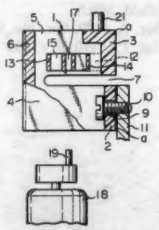
Günter Rochelt, München-Solln, Fed. Rep. of Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 17, 1980, Ser. No. 131,184

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910469

Int. Cl.³ B26B *19/02*

U.S. Cl. 30—43.92 **13 Claims**



1. A reciprocatory drive assembly in a cutter of the type comprising a housing, opposing fixed and movable blade means in said housing, and a drive source for reciprocating said movable blade means relative to said fixed blade means, said reciprocatory drive assembly interconnecting said drive source and said movable blade means and comprising:

a mounting part including:

a carrier portion carrying said movable blade means and including a pair of opposite ends, and

a driven portion connected to said drive source for reciprocation of said carrier portion,

a fixing part anchored to said housing,

a pair of resilient legs connecting said opposite ends of said carrier portion with said fixing part and arranged to be flexed in the direction of reciprocation of said movable blade means when the latter is reciprocated, and

a connecting part oriented parallel to said direction of reciprocation and connecting said resilient legs to each other at a location on the latter between said fixing part and said carrier portion for restraining said mounting part to linear movement in said direction of reciprocation parallel to said fixed blade means.

4,312,127
CUTTING TOOL

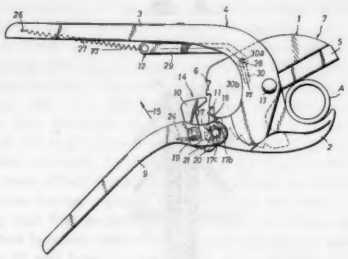
Minoru Tanaka, Higashi-Osaka, Japan, assignor to Hanazono Kogu Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1980, Ser. No. 160,150

Claims priority, application Japan, Aug. 23, 1979, 54-116522[U]; Aug. 23, 1979, 54-116523[U]; Dec. 22, 1979, 54-178341[U]

Int. Cl.³ B23D *21/06;* **B26D** *3/16*

U.S. Cl. 30—92 **15 Claims**



1. A cutting tool comprising a stationary handle formed at its head with a portion for receiving a workpiece; a movable handle pivoted at its one end to the head of the stationary handle and extending in opposed relation to the stationary handle so as to be grippable; a movable blade pivoted to the head of the stationary handle and having a cutting edge opposed to the receiving portion and a ratchet wheel portion opposed to the movable handle, the ratchet wheel portion including teeth arranged at specified spacing along its outer periphery; ratchet means including a drive pawl engageable with the ratchet wheel portion to intermittently drive the movable blade in a cutting direction when the movable handle is turned and a retaining pawl engageable with the ratchet wheel portion to prevent the movable blade from turning in a direction opposite to the cutting direction when the movable handle is turned; returning means provided between the stationary handle and the movable blade for giving the movable blade a turning force acting in the opposite direction; and release means for disengaging the drive pawl and the retaining pawl from the ratchet wheel portion solely by the turn of the movable handle when the movable handle has turned in the opposite direction beyond the range of its cutting movement.

4,312,128
USEFUL DEVICE SUCH AS A CUTTING IMPLEMENT FOR SUSPENDING FROM A KEY RING OR THE LIKE

Theodore A. Olsen, 26 Hollowbrook Ct. W., Peekskill, N.Y. 10566

Filed Jun. 27, 1980, Ser. No. 163,508

Int. Cl.³ B26B *5/00, 11/00*

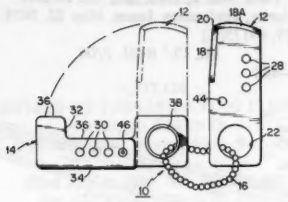
U.S. Cl. 30—157 **16 Claims**

1. A cutting implement comprising:

(a) an elongated blade having a cutting edge along at least one edge and a substantially cylindrical first mounting sleeve through one end of the blade;

(b) an elongated sheath means having an enclosure means along a portion of the length of the sheath open along the length of the enclosure means, for engaging the blade and containing the cutting edge when the implement is in the closed position, the sheath means having a substantially cylindrical second mounting sleeve through one end of the sheath wherein one sleeve is a hole through the blade or sheath means and the other sleeve projects above the

blade or sheath means to permit placement of the other sleeve thereon, whereby one sleeve can be removeably nested within the other sleeve to provide a securing means



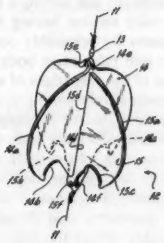
for detachably and pivotally connecting the blade and sheath and a key ring or the like can pass through the sleeves to secure the blade and sheath to the ring.

4,312,129

CUTTING DEVICE FOR USE IN KITE FIGHTING

John D. Fergusson, 711 Yale Ave., Terrace Park, Ohio 45174

Filed Jan. 23, 1980, Ser. No. 114,504
Int. Cl.³ B26B *27/00*
U.S. Cl. 30—296 R **4 Claims**



1. A kite fighting device comprising,
a kite,
a string connected to said kite and a string cutter connected between upper and lower portions of said string, said string cutter comprising,
a pair of crossed planar cutting elements having arcuate outer edges and intersecting each other at approximately right angles,
means connecting said string cutter at the upper and lower ends of the intersection of said cutting elements to the upper and lower portions of said kite string, respectively,
each said cutting element having a recess in one of the upper and lower edges thereof on each side of said intersection for trapping a string within the recess,
a portion of each recess inward of the outer edge of said cutting element having a sharpened edge with the outboard portion of said recess being unsharpened,
whereby in flying said kite across the string of an adjacent kite, said recess can be hooked on the adjacent string to cut the same.

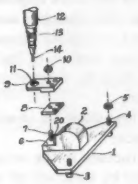
4,312,130

DRAFTING INSTRUMENT

Evan J. Reiff, 5173 Brighton Ave., #6, San Diego, Calif. 92107

Filed Nov. 19, 1979, Ser. No. 95,236
Int. Cl.³ B43L *13/00*
U.S. Cl. 33—18 R **1 Claim**

1. A holder for a drafting pen having screw threads on the pen barrel, said holder comprising:
(a) a transparent planar, generally triangular frame plate;
(b) a pair of bearing points extending from adjacent one edge of said frame plate at two corners thereof;
(c) a generally planar adaptor plate;
(d) a mount for said adapter plate, said mount defining a flat surface disposed on the side of said frame plate opposite said one edge thereof and having an upright bolt and at least one upright peg extending upward from said flat surface;
(e) said adapter plate having a threaded pen barrel-engaging hole in one end thereof and including at least one guide hole to engage said peg and guide said adapter plate



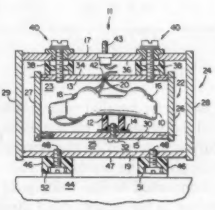
mounted into mounted relation with said frame plate and said adapter plate also having a mounting hole to receive said bolt, and including a retainer nut to retain said adapter plate on said bolt, such that when mounted said one end of said adapter plate extends beyond and generally away from said frame plate and whereby different mounting plates to accomodate different pen types may be substituted for one another in said holder with facility; and
(f) at least one shim plate having holes to accomodate said pegs and bolt to space said adapter plate upward from said frame plate to accomodate pens of different tip-to-threads spacing.

4,312,131

ACCURATE LEVEL SENSOR

Peter J. Scriffignana, Newark, and Theodore T. Hadeler, Montvale, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Oct. 22, 1979, Ser. No. 86,865
Int. Cl.³ G01C *9/26*
U.S. Cl. 33—350 **7 Claims**



1. A level sensor of the type for maintaining an inertial reference member level and stable about its axes, comprising:
a gravity type electrolytic switch including a sealed vial containing electrolytic fluid and electrical contacts;
a first chamber structure for containing the gravity type switch;
first means for mounting the switch within the first chamber structure including a thermally insulating post mounted to the switch, a base mounted to the post, the first chamber structure having a first surface for supporting the base, and means for mounting the base supported by the first surface to said surface;
a second chamber structure containing the first chamber structure;
second means for mounting the first chamber structure

within the second chamber structure including the first chamber structure having a second surface, the second chamber structure having a first surface, a pair of thermally insulating spacers disposed between the second surface of the first chamber structure and the first surface of the second chamber structure, and means for mounting the first and second chamber structures separated by the thermally insulating spacers to each other;

third means for mounting the second chamber structure to the inertial reference member including the second chamber structure having a second surface, a pair of thermally insulating support members disposed between the second surface of the second chamber structure and the inertial reference member, means for mounting the support members to the second surface of the second member, and means for mounting the support members to the inertial reference member;

the switch in the first chamber structure being surrounded by a first air space;

a first chamber structure in the second chamber structure being surrounded by a second air space; and

the first, second and third mounting means and the first and second air spaces are thermally insulating for attenuating ambient temperature gradients affecting the switch.

4,312,132

RAIL TYPE UNIVERSAL PARALLEL RULER DEVICE

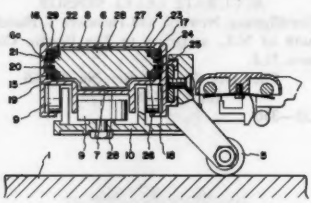
Mutoh Hiroshi; Hikawa Masami; Watanabe Yoshinori, and Yamazaki Kouichi, all of Tokyo, Japan, assignors to Mutoh Industry, Ltd., Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,748

Claims priority, application Japan, Dec. 23, 1978, 53-162228; Dec. 23, 1978, 53-162231; Jul. 20, 1979, 54-91482

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—438 **12 Claims**



1. A rail type universal parallel ruler device comprising:

a horizontal rail for mounting on a drawing board;

a horizontal cursor mounted on the horizontal rail for shifting movement along the horizontal rail;

a vertical rail connected to the horizontal cursor having a cavity extending in the longitudinal direction thereof;

a vertical cursor mounted on the vertical rail for shifting movement therealong;

a balance weight movable along said cavity and a flexible connecting member connected between the vertical cursor and the balance weight for moving in the opposite direction from the vertical cursor; and

at least one pair of magnetic members, one magnetic member of the pair disposed along substantially the entire length of said cavity and the other magnetic member of the pair being on said balance weight and opposed to said magnet on said magnetic member along the cavity for producing a magnetic force in a direction opposite the direction said balancing weight is moved toward said vertical rail due to gravity for causing said balance weight to float relative to the walls defining said cavity during the movement of said balance weight along said cavity.

4,312,133

T-SQUARE

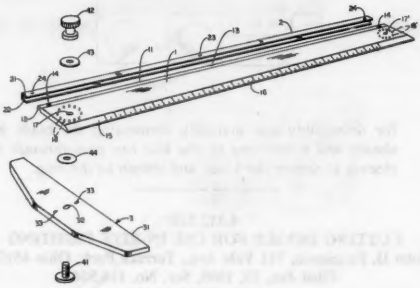
Rikichi Mima, Ikoma, Japan, assignor to Miwa Gomu Kogyo Kabushikikaisha, Osaka, Japan

Filed May 6, 1980, Ser. No. 147,005

Claims priority, application Japan, May 22, 1979, 69174[U]; May 22, 1979, 69175[U]

Int. Cl.³ B43L *7/06*

U.S. Cl. 33—468 **1 Claim**



1. A T-square comprising an elongated ruler main body formed of a plastic material and having a pair of opposed side edges, an auxiliary ruler section having at least one straight edge, connecting means for releasably connecting said auxiliary ruler section to said ruler main body at one end thereof such that at least one of the side edges of said ruler main body extends in selected angular relationship to said straight edge of said auxiliary ruler section, means defining an aperture formed in at least one end of said ruler main body and a corresponding alignable aperture formed in substantially the mid-point of said auxiliary ruler section, said connecting means comprising a pair of cooperable threaded elements at least one of which is insertable into said apertures, said threaded elements being cooperable to releasably secure the ruler main body and the auxiliary ruler section in said selected angular relationship, said threaded elements being constructed to be loosened such that said ruler main body and said auxiliary ruler section can be rotated relative to each other to establish said angular relationship therebetween, one of the opposed surfaces of said ruler main body and auxiliary ruler section being provided with a series of circumferentially spaced retaining bores arranged concentrically about the aperture therein and the other of said opposed surfaces being provided with at least one projection member insertable within an aligned one of said retaining bores, an elongated metallic edge member attachable to said ruler main body so as to cover at least one of the side edges thereof, said edge member being secured to said ruler main body at the longitudinal mid-point thereof, a projection on one of said ruler main body and metallic edge member and a bore in the other, said bore being dimensioned to receive said projection and thereby secure said edge member to said ruler main body at the mid-point thereof, longitudinally elongated cavities formed in said ruler main body at a plurality of locations thereon spaced from said longitudinal mid-point thereof and corresponding projections formed on said edge member, said elongated cavities providing for uneven expansion between said plastic ruler main body and said metallic edge member, one of said cavities being formed in said ruler main body adjacent each of the opposed ends thereof, said metallic edge member being an elongated channel member having a pair of opposed legs, the spacing between said legs being selected such that when said edge member is secured to said ruler main body said legs cover the opposed surfaces of said one side edge, said one side edge being given a reduced thickness relative to the adjacent surfaces of the ruler main body so that when the edge member is secured thereto the outer surfaces of the channel

legs will be flush with the adjacent surfaces of the ruler main body.

4,312,134

METHOD OF FREEZE-DRYING FLOWER ARRANGEMENTS

Robert W. Strausser, 6110 Newton Falls Rd., Ravenna, Ohio 44266

Filed Aug. 4, 1980, Ser. No. 174,842
Int. Cl.³ F26B 5/06, 5/10, 5/04
U.S. Cl. 34—5 12 Claims

1. The process of freeze-drying floral arrangements, comprising the steps of:

arranging freshly cut vegetation in an open container and placing said container in a chamber having a temperature and pressure substantially reduced from the ambiance;

gradually increasing the temperature within said chamber to a terminal point; and

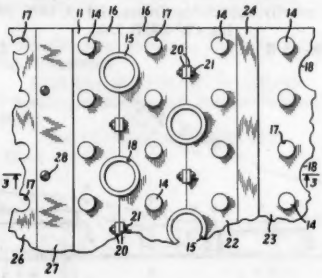
sealing said open container with a lid.

4,312,135

FLUID BED COMBUSTER

John W. Devanney, III, 119 Rowayton Ave., Rowayton, Conn. 06853

Filed Jan. 16, 1980, Ser. No. 112,529
Int. Cl.³ F26B 3/08
U.S. Cl. 34—10 7 Claims



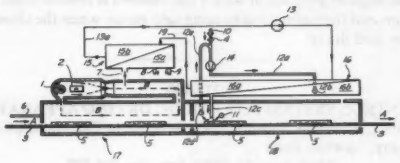
1. A fluid bed combustor comprising a chamber for containing a bed of relatively inert particles and having a substantially horizontal distributor plate comprising a plurality of elongated tiles aligned adjacent one another, at least some of said tiles having scallops spaced along the side edges thereof such that when one scallop tile is placed adjacent a correspondingly scalloped tile, the scallops of said one tile will be in register with the scallops of the adjacent tile so as to form holes, a plurality of heat extractor tubes which pass upwardly through said holes in said plate in a substantially vertical direction, said tubes being distributed substantially over the entire plate surface so as to permit efficient heat extraction from the entire fluid bed volume, and means for supplying combustion gas through said plate to support combustion and to fluidize the bed.

4,312,136

ARRANGEMENT AND METHOD OF DRYING ARTICLES

Friedrich Bahner, Rotenburg; Kurt Eberhardt, Bad Hersfeld, and Ernst Lotz, Haunetal 1-OT Neukirchen, all of Fed. Rep. of Germany, assignors to Buettner-Schilde-Haas AG, Krefeld, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,542
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613512
Int. Cl.³ F26B 3/00
U.S. Cl. 34—35 12 Claims



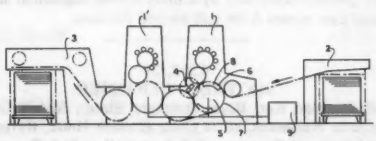
1. A method of drying articles, particularly plasterboard, comprising the steps of advancing articles to be dried along a path; heating a first drying medium to a first temperature at an upstream portion of the path; directing the heated first medium towards the articles in a direction countercurrent to the direction of the advancement said articles along said path, for initial drying of the latter at said upstream path portion, whereby the heated first medium becomes charged with a first moisture content; withdrawing a portion of the moisture-charged and heated first medium from said upstream path portion and advancing said withdrawn portion to a heat exchanger; effecting heat exchange between said withdrawn portion and a second drying medium, for heating the latter to a second temperature lower than said first temperature; and directing the heated second medium towards the articles at a downstream portion of the path in a direction transversely of the advancement said articles along said path for further drying of the articles so that the heated second medium becomes charged with a second moisture content less than said first moisture content.

4,312,137

DRYING DEVICE IN A SHEET-FED ROTARY PRINTING PRESS

Hans Johne; Christian Lucas, both of Radebeul; Karl-Heinz Foerster, Dresden; Klaus Schanze, Coswig; Arndt Jentsch, Coswig; Wolfgang Mueller, Coswig, and Horst Schulz, Dresden, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 25, 1980, Ser. No. 115,286
Claims priority, application German Democratic Rep., Feb. 1, 1979, 210748
Int. Cl.³ F26B 15/04
U.S. Cl. 34—43 3 Claims



1. In a sheet-fed rotary printing press having an impression cylinder provided with an axially directed channel for accommodating sheet clamping means, a combination comprising a drying device arranged above said impression cylinder to transmit heat rays against the printed sheets on the impression cylinder; an electrical motor for driving the printing press; two

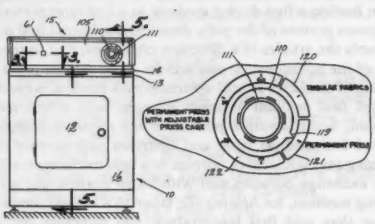
parallel-connected power supply circuits for said electrical motor, each power supply circuit including a separate switch; screening means arranged in said printing press for moving between an inactive position in which it exposes the sheet on said impression cylinder to said dryer when the press is running and a screening position between said dryer and said impression cylinder when the press comes to full stop; and control means coupled to one of said switches to control the driving motor in response to the position of said channel relative to said dryer, said control means activating said motor when the other switch is opened, the drying device is in operation, the printing press comes to full stop and the impression cylinder is in an angular position in which the channel is remote from the dryer, and thereafter deactivating said motor when the channel faces said dryer.

4,312,138

CONTROL SYSTEM FOR FABRIC DRYING APPARATUS

David I. Ellington, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Aug. 19, 1980, Ser. No. 179,737
Int. Cl.³ F26B *21/06*
U.S. Cl. 34—45 **19 Claims**



1. A control system for a fabric drying apparatus including a rotatable fabric tumbler and heated airflow means for drying fabrics in said tumbler and operable through a plurality of selectable cycles of operation, the combination comprising: control circuit means including timer means having switch means and timer driven sequentially advanceable cam means for controlling actuation of said switch means, said cam means being manually settable to a first predetermined angular position for selection of a first cycle of operation and alternately being manually settable to a second angular position for selection of a second cycle of operation, said control circuit means further including means operable with said cam means located statically in said first predetermined angular position for initiating said first cycle of operation; and means for automatically terminating operation of said apparatus when the fabrics are dry, said control circuit means being operable with said cam means in said second position for initiating said second cycle of operation including an automatically terminated drying cycle portion and a selectable-length timed secondary tumbling cycle portion controlled by a timer driven sequential advance of said cam means from said second position.

4,312,139

MATERIAL WEB DRIER

Erich Preisler; Karl Bilek; Reinhard Pinter; Rudolf Greimel; Milada Weinmann, all of Graz; Herbert Holik, Ravensburg, and Guntram Feurstein, Grünkraut, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

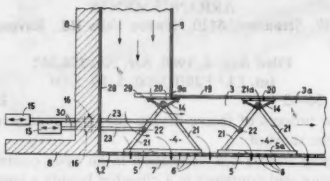
Filed Jun. 23, 1980, Ser. No. 161,747
Claims priority, application Austria, Jul. 2, 1979, 4599/79
Int. Cl.³ F26B *13/02, 21/12*
U.S. Cl. 34—54 **19 Claims**

1. A material web drier containing a hood drier arrangement for controlling the gas flow of a drying medium applied to a material web which is to be dried, comprising:

means coacting with said material web to be dried for infeeding a drying medium thereto;

said drying medium-infeed means containing discharge openings through which flows the drying medium for contact with the material web;

means for selectively completely freeing or partially or completely closing said discharge openings, in order to thereby selectively alter the impingement of the material



web by the drying medium at discrete locations thereof, both in the lengthwise direction and also in the transverse direction of said material web; and

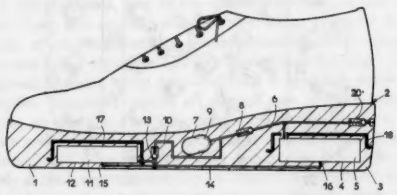
said means for selectively completely freeing or partially or completely closing said discharge openings being structured to enable controlled impingement of the material web by the drying medium at different intensities over the width of the material web without simultaneously altering the impingement intensity of the drying medium in the lengthwise direction of the material web.

4,312,140

DEVICE TO FACILITATE PEDESTRIAN LOCOMOTION

Walter Reber, 50, Rue du Marechal Foch, Saverne 6700, France

Filed Mar. 28, 1980, Ser. No. 134,785
Claims priority, application France, Apr. 3, 1979, 79 08877
Int. Cl.³ A43B *7/06*
U.S. Cl. 36—3 B **22 Claims**



1. A device to facilitate locomotion of a person moving by foot on the ground and adapted to be used in shoes worn by the person, each shoe having a forward portion and a rearward portion, comprising in combination:

first storage means for storing a certain amount of energy upon one of said portions impacting with the ground, and

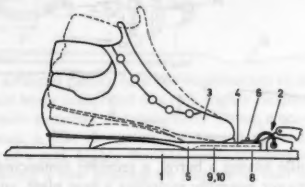
second storage means communicating with the first storage means for receiving at least a substantial proportion of the energy stored in said first storage means, and for releasing at least a substantial proportion of the energy stored in said second storage means as the other of said portions is about to execute a lifting motion from the ground, so that the released energy acts in a direction to aid said lifting motion.

4,312,141

CROSS COUNTRY SKIING BOOT FITTING INTO A DEVICE FOR THE LATERAL GUIDANCE THEREOF OF THE SKI

Hubert Mayer, Marly, and Ernst Praudisch, Möhlin, both of Switzerland, assignors to Bata Schuh AG, Mohlin, Switzerland

PCT No. PCT/CH78/00051, § 371 Date May 5, 1980, § 102(e) Date Feb. 14, 1980
PCT Filed Dec. 13, 1978, Ser. No. 196,911
Claims priority, application Switzerland, Sep. 5, 1978, 9302/78
Int. Cl.³ A43B 5/04; A63C 9/00
U.S. Cl. 36—117 5 Claims



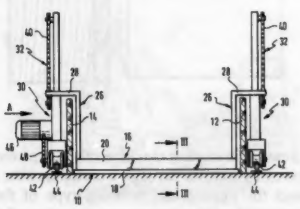
1. Cross country skiing boot fitting into a device for the lateral guidance and front fixing thereof on the long distance ski, characterised in that in the boot sole (5) is provided at least one depression or one elevation (10) in the direction of the longitudinal axis of the boot which, with the corresponding elevation or depression (9) in the device, effects the lateral guidance of the boot during cross country skiing and that the depressions or elevations in the sole and the corresponding depressions or elevations in the guidance device extend from the boot fixing device at the front to the end of the front part of the boot sole at the rear, ensuring the engagement of the elevations in the depressions during all foot movements in cross country skiing.

4,312,142

DEVICE FOR PREPARING THE SURFACE OF ICE RINKS

Daniel H. Toepffer, Schwedenstrasse 70, D-8000 Muenchen 40, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 108,083
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856492
Int. Cl.³ E01H 1/02; B05B 3/00
U.S. Cl. 37—1 9 Claims



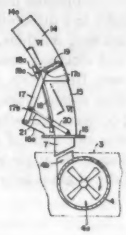
1. In a mobile device for preparing the surface of ice-rinks, especially artificial ice-rinks with a substantially rectangular rink, having at least one ice-scraping device for the mechanical smoothing of the ice surface and a distributing device for the even application of a film of water on the mechanically smoothed ice surface, the improvement that an ice-scraping device and a distributing device are mounted on a framework which extends substantially parallel to a first rink edge across the whole rink and is slidingly guided at its axial ends along two other second rink edges running substantially at right angles to the first rink edge.

4,312,143

CHUTE STRUCTURE OF SNOW PLOUGH

Tetsuro Kado, Niigata, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1980, Ser. No. 140,634
Int. Cl.³ E01H 5/00
U.S. Cl. 37—43 R 7 Claims



1. In a chute apparatus for use in a snow plough vehicle including a stationary duct having one end in communication with a discharge opening of a blower, and at least one movable duct telescopically mounted on said stationary duct, said movable duct being slantingly oriented upwardly from the other end of said stationary duct in an operative state, and being superimposed with said stationary duct in a non-operative state to lower the position of a discharge opening of said movable duct, the improvement comprising:

(a) said stationary duct and said at least one movable duct having axial curvatures substantially equal with each other to provide arcuate ducts,

(b) means for moving said at least one movable duct so as to axially aligh the same with said arcuate stationary duct during an operative state, and to superimpose said movable duct with said arcuate stationary duct during a non-operative state, said means for moving said movable duct comprising,

(c) at least one link having one end pivotably secured to a stationary portion of said snow plough vehicle,

(d) at least one slot member secured to a lower portion of said movable duct, said link having the other end in sliding engagement with said slot member, and

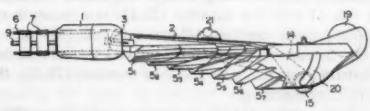
(e) a hydraulic cylinder having one end pivotably secured to said stationary portion and the other end pivotably secured to said link.

4,312,144

MULTI-BLADE DITCHING MACHINE

Takuji Ezoe, 7-14, Tsukushino 2-chome, Machida-shi, Tokyo, Japan, assignor to Takuji Ezoe, Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 91,482
Int. Cl.³ E02F 5/02
U.S. Cl. 37—98 2 Claims



1. A multi-blade ditching machine comprised of a stabilizing wing, an elongated hollow center body movably connected to said stabilizing wing, said center body being movable in the vertical direction with respect to said stabilizing wing, a plural-

ity of blades disposed along said center body at predetermined intervals, the blades which are positioned at the rear portion of said ditching machine having a greater vertical length and smaller horizontal extent transverse to the direction of movement than the more forwardly disposed blades and adapted to ditch more deeply with narrower ditching widths, wherein said center body has a plurality of small hole means at the bottom thereof positioned towards the back portion of each blade, for permitting the flow of water to the rear of the blade, thereby increasing the pressure at the rear thereof, wherein at least the two most forward of the blades have a ditching means for ditching soil and a soil-pushing means for pushing said soil substantially horizontally in a direction transverse to the moving direction of the ditching machine, the soil-pushing means being at the top of said ditching means and having a wider horizontal width as seen from front of the ditching machine than that of said ditching means when the ditching machine is in a normal operating position, and wherein at least a portion of the edge of the extreme side ends of at least one of said soil-pushing means forms an acute angle with respect to the vertical and the vertex of the angle is below the upper edge of the soil pushing means.

4,312,145

REPLACEABLE FASTENER FOR COVER PLATES AND THE LIKE

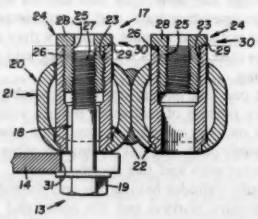
Paul J. Lukavich, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00021, § 371 Date Jan. 9, 1980, § 102(e) Date Jan. 9, 1980, PCT Pub. No. WO81/02045, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 9, 1980, Ser. No. 127,992

Int. Cl.³ E02F *5/00*; F16B *27/00*

U.S. Cl. 37—124 **3 Claims**



1. In a mounting assembly (13) having a first member (21,22), a second member (14) mounted on said first member (21,22), and fastening means (17) for releasably securing said second member (14) to said first member (21,22), said fastening means (17) including an internally and externally threaded bushing (24) threadably connected externally to said first member (21,22), and a bolt (18) extending through said second member (14) and threadably connected internally of said bushing (24), said bushing (24) including a head (28) thereon engaging an outer side of said first member (21,22) at a location remote from said second member (14) and said bolt (18) including a head (19) disposed on an outer side of said second member (14) at a location remote from said first member (21,22), the improvement comprising:

said first member (21,22) including a grid frame (20) composed of a plurality of grid members (21) and a cylindrical bushing (22) secured in one of said grid members (21) and wherein said internally and externally threaded bushing (24) is threadably connected externally to said cylindrical bushing (22).

4,312,146

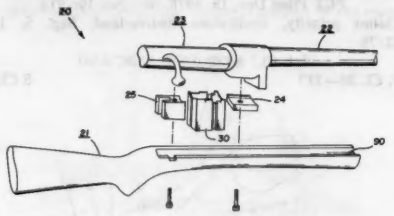
RIFLE BARREL AND RECEIVER MOUNTING MEANS FOR RIFLE STOCK

Homer E. Koon, Jr., Carrollton, Tex., assignor to Alpha Arms, Inc., Dallas, Tex.

Filed Dec. 7, 1979, Ser. No. 101,274

Int. Cl.³ F41C *23/00*

U.S. Cl. 42—75 C **7 Claims**



1. In a rifle having a barrel, a receiver connected with the barrel, a trigger assembly including a base plate, and a stock, the improvement comprising: a forward stock insert mounting block supporting the forward end of said receiver in said stock and a rear stock insert mounting block longitudinally spaced from said forward mounting block supporting the rear end of said receiver in said stock, each of said mounting blocks having a cylindrical upper supporting surface portion shaped and sized to mate with a cylindrical lower portion of said receiver.

4,312,147

ARRANGEMENT IN AN AUTOMATIC ANGLING MACHINE

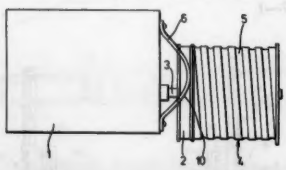
Thorbjorn Christiansen, 8400 Sortland, Norway

Filed Mar. 24, 1980, Ser. No. 132,840

Claims priority, application Norway, Mar. 28, 1979, 791021; Dec. 27, 1979, 794286

Int. Cl.³ A01K *91/02*

U.S. Cl. 43—15 **4 Claims**



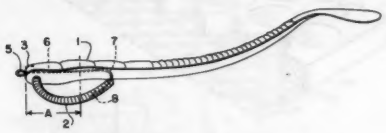
1. In an automatic angling machine of the type comprising a line reel driven by a motor through a clutch device, and which may be used for jigging and bobbing type of fishing with automatic reversal of the movement direction of the fishing line and for automatic hauling by increased line load, the improvement comprising;

a drum mounted next to and as an extension of the line reel, said drum having a helical line-guiding groove which is adapted to receive the portion of the fishing line comprising angles or drags, a line guide being provided in association with the drum and being adapted to guide the line from the line reel onto the helical drum when contacted by an element attached to the fishing line.

4,312,148
WEEDLESS FISHING LURE

James E. Hardwicke, III, 708 Arbutus Dr., Columbia, S.C. 29205

Filed May 19, 1980, Ser. No. 150,914
Int. Cl.³ A01K 85/00
U.S. Cl. 43—42.24 19 Claims



1. In an artificial fishing lure the combination comprising

(A) a main body composed of a soft, highly flexible, resilient polymeric material, said main body having a nose end; and

(B) at least a first elongated weedguard appendage composed of a soft, highly flexible, resilient polymeric material having a low penetration resistance, said appendage being coupled to said main body in close proximity to the nose end thereof, said appendage having a thickness when relaxed and undistorted of between 2 and about 7 mm., said appendage having a length when relaxed and undistorted of greater than 2 cm.,

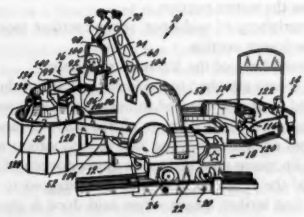
(C) a hook consisting of an eye, a shank, a bight and terminating in a pointed end and barb, said hook being coupled to said body such that said pointed end and barb of said hook are situated outside of said main body with said pointed end pointing longitudinally in the general direction of said nose end of said main body,

said first weedguard appendage being axially impaled by and completely enclosing said barb and pointed end of said hook such that the trailing end of said weedguard appendage extends rearwardly past the barb which thereby restrains said weedguard appendage so that the bite of a fish causes said pointed end and said barb of said hook to penetrate outwardly through said weedguard appendage.

4,312,149
TRANSFER MECHANISM UTILIZING A PIVOTABLE HOLDING MEMBER

Noriaki Iwao, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 30, 1979, Ser. No. 98,940
Int. Cl.³ A63H 33/30, 11/00
U.S. Cl. 46—40 10 Claims



1. A transfer mechanism for moving an article from a first location to a second location which comprises:

a stationary base radially displaced from both said first and said second locations;

article carrier means rotatably mounted on said base such that at least a portion of said article carrier means is capable of moving from said first location to said second location, both of said locations being spaced from said base, said article carrier means including a support member, an article holding member and pivot means connecting said support and article holding members;

said support member having a first end arcuately movable through an arc from a position adjacent to said first location to a position adjacent to said second location;

said article holding member including a surface capable of supporting said article within said article holding member, said article carrier means further including a wall means projecting upwardly from said surface, said wall means capable of maintaining said article on said surface, said wall means including an opening through said wall means, said opening located over a position of said surface, said opening sized to allow said article to roll through said opening over said portion of said surface onto and off of said surface;

said pivot means pivotally attaching said article holding member to said first end of said support member so that said portion of said surface below said opening is movable toward and away from said second location when said support member is adjacent to said second location;

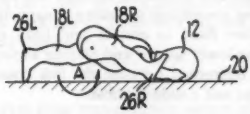
a stationary platform located at said second location, said platform including a stationary edge at least a portion of said edge being capable of engaging said article holding member during rotation of said support member;

engagement means on said article holding member for engaging said edge, said means operatively engaging said edge as said first end of said support member moves adjacent to said second location so as to pivot said article holding member about said pivot means so as to incline said surface so as to move said portion of said surface below said opening lower than the remainder of said surface so that an article will roll off of said surface through said opening onto said platform.

4,312,150
ANIMATED DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,940
Int. Cl.³ A63H 11/00
U.S. Cl. 46—120 15 Claims



1. A doll, comprising:

a doll torso portion;

a pair of legs movably mounted to the torso;

means for moving said legs relative to said torso portion from a first position generally aligned straight outwardly of said torso portion with said doll in a generally prone position, a supporting surface to a second position generally transverse to said torso portion with said doll in a sitting position with said torso portion oriented generally vertically forming a right angle with respect to said supporting surface; and

said moving means including a first leg moving means for rotating one of said legs approximately 150° to a position alongside said torso portion, second leg moving means for rotating the other of said legs approximately 150° to a position alongside said torso portion, torso portion moving means for rotating said torso portion approximately 90° from said prone position to a vertically oriented sitting position, and timing means for activating said first leg moving means, said second leg moving means and said torso portion moving means successively in a timed sequence.

4,312,151

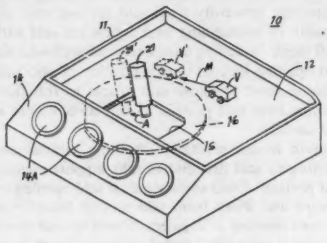
CONTROLLABLE RESPONSE SYSTEMS

Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044

Continuation-in-part of Ser. No. 11,446, Feb. 12, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,048

Int. Cl.³ A63H *33/36*

U.S. Cl. 46—240 **8 Claims**



1. A toy for providing remote control over a miniature toy vehicle comprising

a frame having a base and an upper playing surface thereon;

a linkage mechanism mounted on said base beneath said playing surface extending to a control knob;

a toy vehicle on said playing surface;

a cut-out in said playing surface for confining the movement of said control knob;

means carried by said control knob including a shield covering said linkage mechanism in the area of said cut-out and underlying that part of the playing surface adjoining said cut-out for concealing the linkage mechanism connected to said control knob;

said linkage mechanism being formed by a set of four pivoted links, a fixed pivot pivotally securing one end of one of said links to said base, said linkage extending therefrom to an assemblage for coupling said mechanism to said toy vehicle;

said control knob being connected to the free end of an intermediate link between said fixed pivot and coupling assemblage, and projecting through said cut-out;

said coupling assemblage including a magnetically permeable member fixed to one of said links and supported against the lower side of said playing surface by a spring which is interposed between the link connected to said assemblage and a slide member.

4,312,152

BUOYANT SUPPORT STRUCTURE AND SYSTEM AND METHOD USING STRUCTURE FOR WATER CULTURE OF PLANTS

Daniel Drury, Gorham, N.H.; Geoffrey Drury, Canaan, and G. Graham Davidson, Jr., Lakeville, both of Conn., assignors to Agrownautics, Inc., Salisbury, Conn.

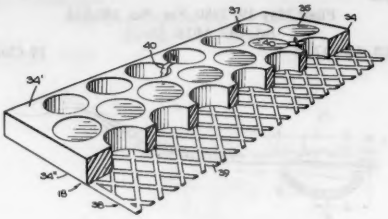
Filed Jun. 9, 1980, Ser. No. 157,696

Int. Cl.³ A01G *31/02*

U.S. Cl. 47—63 **19 Claims**

1. A support structure for the hydroponic cultivation of plants, the support structure comprising:

a lightweight, buoyant, panel-like pallet adapted to support regularly spaced arrays of plants at predetermined spacings corresponding to advancing growth stages, the pallet including an array of integral punch-out plugs formed from the material of the pallet and arranged in a multiplicity of equally spaced rows, the cross-sectional size of the plugs being predetermined to permit easy insertion and withdrawal of seed blocks into and from holes in the pallet which result from removal of the plugs, whereby selected plugs of the array, spaced apart according to the size of



plants at a given growth stage, can be removed for insertion of such plants into the resulting holes.

4,312,153

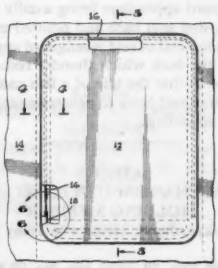
DOOR SEAL

William R. Parkinson, Canyon Country; Thomas R. Swift, Sun Valley, and Paul F. Ivanick, Los Alamitos, all of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 14, 1979, Ser. No. 103,761

Int. Cl.³ E06B *7/16*

U.S. Cl. 49—485 **9 Claims**



1. Apparatus for sealing a door and the frame of said door around the peripheries thereof comprising: first striker means coupled to the upper portion

of the periphery of said door; second striker means coupled to the lower portion

of the periphery of the frame of said door;

first lip means attached to the lower portion of the periphery of said door and adapted to mate with said second striker means when said door is closed and to have portions thereof extending beyond said second striker means;

second lip means attached to the upper portion of the periphery of the frame of said door and adapted to mate with said first striker means when said door is closed and to have portions thereof extending beyond said first striker means;

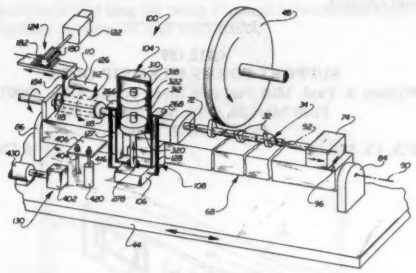
the extended portions of said first and second lip means being configured to mate with one another in an overlapping manner when said door and said frame are engaged in portions of said door and said frame of said door between said upper and lower peripheries thereof to completely seal said door and said frame and said first striker means and said first lip means are alternately opposed to said second striker means and said second lip means.

4,312,154

GRINDING MACHINE AND METHOD

Roger H. Fournier, Millbury; Richard P. Chase, Spencer, and Gary E. Englander, Shrewsbury, all of Mass., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 5, 1979, Ser. No. 82,039
Int. Cl.³ B24B 5/36
U.S. Cl. 51—101 R 54 Claims



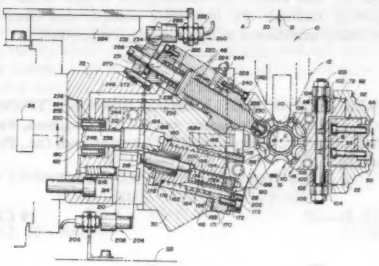
1. A grinding machine for use in grinding a cam lobe on a camshaft, said grinding machine comprising rotatable grinding wheel means for removing material from the cam lobe at a first rate during a rough grinding operation and for removing material from the cam lobe at a second rate which is less than the first rate during a finish grinding operation, workpiece support means for supporting the camshaft during the rough and finish grinding operations, said workpiece support means being movable toward and away from said grinding wheel means between a retracted position in which the cam lobe is spaced from said grinding wheel means, an operating position in which the cam lobe is engageable by said grinding wheel means and an index position which is disposed intermediate said operating and retracted positions, motor means for moving said workpiece support means between the retracted, operating and index positions, biasing means connected with said workpiece support means for urging said workpiece support means toward said grinding wheel means with a first force during a rough grinding operation and for urging said workpiece support means toward said grinding wheel means with a second force which is less than the first force during a finish grinding operation, control means connected with said workpiece support means for use in effecting movement of said workpiece support means toward and away from said grinding wheel means as a function of the desired configuration of the cam lobe, said control means including a master cam element having a configuration which is a function of the desired configuration for the cam lobe and a cam follower element, said biasing means being effective to urge said master cam element and cam follower element toward a condition of abutting engagement with the first force during a rough grinding operation and with the second force during a finish grinding operation, one of said master cam and cam follower elements being connected with said workpiece support means for movement therewith relative to the other of said master cam and cam follower elements, said one of said master cam and cam follower elements being spaced from the other of said master cam and cam follower elements by a first distance when said workpiece support means is in the retracted position, being spaced from the other of said master cam and cam follower elements by a second distance which is less than said first distance when said workpiece support means is in the index position and being disposed in abutting engagement with the other of said master cam and cam follower elements when said workpiece support means is in the operating position.

4,312,155

APPARATUS FOR GRINDING GROOVES IN THE INNER RACE OF A CONSTANT VELOCITY UNIVERSAL JOINT

Kazimierz Reda, Springfield; Roald Cann, Wethersfield, and Lawrence A. Ambrose, Springfield, all of Vt., assignors to Bryant Grinder Corporation, Springfield, Vt.

Filed May 8, 1980, Ser. No. 147,983
Int. Cl.³ B24B 5/00
U.S. Cl. 51—105 R 15 Claims



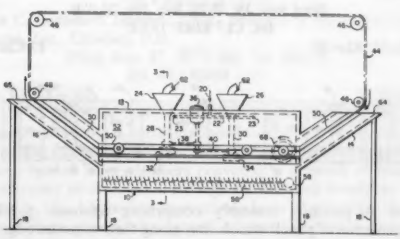
1. In apparatus including a rotatable grinding wheel and a rotatable holder for supporting the inner race of a constant velocity universal joint about a rotational axis so as to grind circumferentially spaced pairs of grooves on diametrically opposite sides of a central axis of the race by grinding one pair of the grooves at a time, the improvement comprising: a clamp including a pair of jaws mounted on the holder for movement with respect thereto and with respect to each other; the clamp also including an operator that rotates with the holder and has a high clamp mode for positioning the jaws so as to hold the race therebetween in a fixed relationship with the central axis of the race at a predetermined location on the holder during grinding of each pair of grooves; the jaw operator having a low clamp mode for permitting indexing movement of the race about the central axis thereof on the holder as the holder rotation proceeds; and indexing means that rotates with the holder and indexes the race about the central axis thereof with the jaw operator in its low clamp mode such that the indexing is performed as the holder rotation continues and the apparatus thereby grinds each pair of grooves in the race without stopping the holder rotation.

4,312,156

APPARATUS FOR CRYOGENIC SHOT-BLASTING

Thomas E. McWhorter, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 17, 1980, Ser. No. 130,905
Int. Cl.³ B24C 3/14, 9/00
U.S. Cl. 51—418 11 Claims



1. An apparatus for cryogenically shot blasting an article which comprises a housing including an entry station, an entry port communicating between the entry station and the exterior

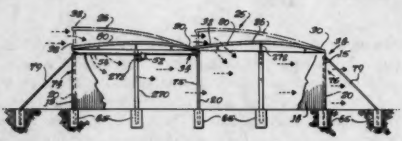
of the housing, an impacting station, an exit station, and an exit port communicating between the exit station and the exterior of the housing, the exit port being at a greater vertical elevation than the entry port and both the entry port and the exit port being at a greater vertical elevation than the impacting station, means for introducing a cryogen into the housing, means for transporting an article to be treated sequentially from the entry station, through the impacting station and to the exit station, means for directing media at high velocity to impact upon an article being transported through the impacting station, and means for rotating the article while being transported through the impacting station, said impacting station being maintained at a cryogenic temperature.

4,312,157

GREENHOUSE WITH HINGED ROOF SECTIONS

Roger D. Hertel, Buffalo Grove, and Rick J. Chapman, Vernon Hills, both of Ill., assignors to IBG International, Inc., Prairie View, Ill.

Filed May 19, 1980, Ser. No. 151,367
Int. Cl.³ A01G *9/24*; E04B *7/16*
U.S. Cl. 52—13 **19 Claims**



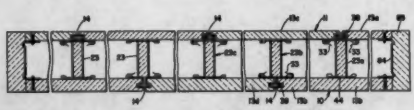
1. In a greenhouse structure, the combination comprising: a plurality of vertical columns at spaced longitudinal and lateral positions defining laterally spaced rows of columns, vertical side walls for said structure interconnected with said columns, roof sections having hinge ends for pivoting about a hinge axis and oppositely disposed lift ends for being lifted relative to said sides wall to define open slots allowing ambient air flow into or from said structure, said roof sections spanning the laterally spaced rows of columns and being supported thereby, said roof sections including a superstructure and light transmitting panels thereon covering a substantial extent of said roof section, means for hingedly mounting ends of said roof section to one row of said columns, and lifting means connected to another row of columns and to said lift ends of the roof sections for pivoting the lift ends about said hinge axis to an open position allowing ambient air to flow into or from the interior of the greenhouse structure.

4,312,158

FIRE-RESISTANT DEMOUNTABLE PARTITION STRUCTURE

Jonathan P. Teli, Avon Lake, and Robert F. Worley, Bay Village, both of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Sep. 19, 1979, Ser. No. 76,870
Int. Cl.³ E04F *19/00*
U.S. Cl. 52—39 **17 Claims**



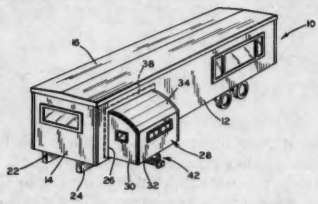
16. A partition assembly comprising opposed, parallel, spaced rows of panels which abut along their adjacent edges at joints therebetween, a stud along each joint formed of a fire-resistant core of insulation material and opposed channel-shaped metal elements secured to opposite sides of said core to provide oppositely extending flanges adjacent to the inner sides of the associated of said panels, and connecting means along at least one side of said stud secured to said panels without being exposed to the exposed surface thereof connecting said associated panels to the associated flanges, said panels being formed of fire-resistant material which tends to shrink and cause opening of said joints when subjected to high temperatures, said core bridging an open joint resulting from said shrinkage to prevent direct exposure of said channel-shaped elements to heat at said joint, said connecting means being structured to minimize transmission of heat therethrough to said channel.

4,312,159

SUPPORT FOR TRAILER TIP OUTS

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

Filed Mar. 20, 1980, Ser. No. 132,264
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—67 **5 Claims**



1. In a trailer having an opening in a wall thereof, an additional room moveable between a storage position within the trailer and an operation position extending through said opening from said wall, and two spaced beams underneath said trailer, supporting means for supporting said additional room when in the operating position, said supporting means comprising a hollow stationary member, means affixing said stationary member to said beams, a moveable member telescoping in said stationary member and moveable relative thereto, said moveable member having one position in which an end portion is under said additional room and another position in which the end portion is under the trailer, upright means carried by the end portion of said moveable member for engaging and supporting said additional room when in the operating position, and separate from said additional room when in the storage position, said stationary member having transverse openings therein, said moveable member having transverse openings therein, said openings being aligned when the end portion of said moveable member is in the position under said trailer, whereby a pin can be extended through said transverse openings to hold said moveable member immovable relative to said stationary member.

4,312,160

BUILDING STRUCTURE HAVING AN IMPROVED TRUSS ASSEMBLY

John V. Wilbanks, Theodore, Ala., assignor to June Landers Wilbanks, Theodore, Ala.

Filed Jan. 10, 1980, Ser. No. 110,947
Int. Cl.³ E04B *7/08*; E04C *3/42*
U.S. Cl. 52—92 **6 Claims**

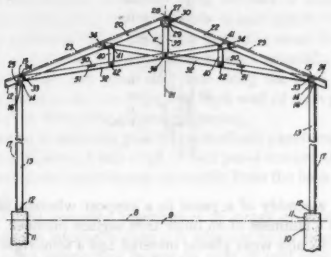
1. A truss assembly comprising:

(a) a pair of upwardly and inwardly converging, generally straight, opposed roof rafters disposed in generally transverse alignment, the inner end portions of which are in abutting relationship to each other to define a peak for said rafters along a vertical centerline;

(b) a pair of truss struts disposed generally below said roof rafters, the outer end portions of said truss struts being respectively connected to the opposite sides of the outer

end portion of said roof rafters, the inner end portion of each of said truss struts being connected to the side of the opposite roof rafter from the roof rafter to which its outer end portion is connected, said inner end portion being connected thereto intermediate the ends of such roof rafter, said truss struts having intermediate portions crossing and spaced from each other below said peak;

(c) a king pin connected to said intermediate portions of said truss struts and said roof rafters, the upper end portion of said king pin abutting and being fixed to the lower surfaces of the end portions of said roof rafters, the lower end portion of said king pin being disposed between said intermediate portions of said truss struts.



(d) a common bolt extending through one of said truss struts and thence through the lower end portion of said king posts and thence through the other of said intermediate portions of said truss struts;

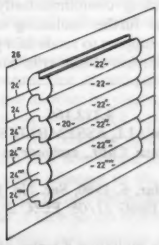
(e) a pair of opposed, spaced, vertically arranged, queen posts disposed on opposite sides of said vertical centerline and having their upper ends respectively abutting the lower edges of said roof rafters at positions adjacent to the inner end portions of the other of said truss struts, said queen posts being fixed to the sides of said inner end portions of said truss struts and extending generally vertically downwardly, said queen posts being respectively joined at their lower end portions to side portions of said truss struts.

4,312,161

LOG-JOINT SYSTEM

Sebastian M. Goldade, General Delivery, Grande Prairie, Alberta, Canada (T8V 2Z7)

Filed Jan. 28, 1980, Ser. No. 115,979
Claims priority, application Canada, Feb. 28, 1979, 322509
Int. Cl.³ E04B 1/10
U.S. Cl. 52—233 **9 Claims**



1. An elongate structural member of generally cylindrical shape disposed about a longitudinal axis and having in its external surface two female grooves, the first of which extends longitudinally of the crown of the member from end to end thereof, the second of which extends longitudinally of the nether side of the member from end to end thereof, each groove having a cross-sectional shape which is uniform throughout its length and which is defined by first and second faces, one of which is flat, while the other is of an arcuate shape corresponding generally to the curvature of the external surface of the member, said groove leaving adjacent thereto a longitudinally extending male tongue bounded by said flat face and part of the uncut external surface of the member, whereby the member can be interfitted with a second similar member having female grooves and male tongues complimentary to said tongues and grooves respectively of the first member, by engaging a tongue of each member in a groove of the other member so that the said flat faces of the tongue and groove of the respective members are generally in contact and a portion of the uncut curved exterior surface of each member lies generally in contact with the arcuate surface defining the groove of the other member.

4,312,162

REINFORCED POLE

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572

Filed Aug. 15, 1979, Ser. No. 66,562
Int. Cl.³ E04H 12/16, 12/12
U.S. Cl. 52—309.16 **15 Claims**

1. A structural element comprising a resin bonded filament wound pole, a discrete reinforcing region integral with said pole and perimetrically disposed and selectively placed thereon, said region being formed of a composite material including a plurality of pre-stressed longitudinally disposed fibers and a bonding agent embedding and structurally joining said fibers to said pole, said fibers being cast under stress in said bonding agent so that said pole is in stressed condition after the bonding agent is set, the bonding of said pre-stressed fibers to said pole by said bonding agent in said discrete reinforcing region serving to integrate said reinforcing region with said pole to increase the inertial moment thereof and provide increased resistance to tensile and compressive stresses, said fibers being bunched in separate packets and varying stepwise in longitudinal length along said pole to define a narrowing taper for said reinforcing region along said pole, the thickness of said region along said pole varying in relation to said taper.

4,312,163

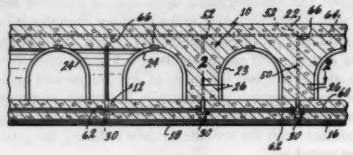
REINFORCED STRUCTURAL MEMBER AND METHOD OF FABRICATION

John C. Leemhuis, Downey, Calif., assignor to Aircontroi Systems, Inc., Carolina, P.R.

Filed Aug. 27, 1979, Ser. No. 69,874
Int. Cl.³ E04B 1/16
U.S. Cl. 52—381 **3 Claims**

1. In an improved composite truss member, having a slab of concrete including a horizontal base slab, which has reinforcing means extending through the slab, a web formation comprising spaced form members providing a network of spaces for allowing air circulation through the network overlying the base slab, the slab having an overlying layer of concrete on the web formation and having spaced columns of concrete extending through the web formation to said base slab, the base slab having reinforcing members embedded in the slab, the improvement including the reinforcing members having member portions extending through the said columns, the said member

portions being individually separable and including a first section embedded in the base slab, and a second section detachably securable to the first section, whereby the base slab can be poured without the second sections in place, so as to not be in the way during pouring, the said first sections including sockets to detachably receive the second sections, the second sec-



tions having upper end parts adapted for securing to reinforcing members embedded in the upper part of the truss member, each of the said sections having a threaded bore at one end adapted to have a part of a second section threaded thereinto, and each of said first sections having a bore, at the other end adapted to be utilized for supporting material from a ceiling of a finished structure.

4,312,164

INSULATING BONDED MASONRY

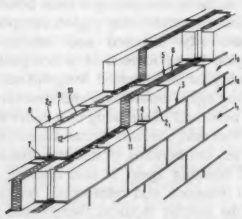
Hans Walt, Schlatt, and Peter Keller, Pfungen, both of Switzerland, assignors to Keller AG Ziegeleien, Pfungen, Switzerland

Filed Feb. 4, 1980, Ser. No. 118,416

Claims priority, application Switzerland, Feb. 16, 1979, 1574/79

Int. Cl.³ E04B *2/02*

U.S. Cl. 52—405 **16 Claims**



1. An insulating bonded brickwork comprising:

adjacent rows of substantially vertically arranged bricks forming the brickwork;

each brickwork row comprising a plurality of adjacent bricks arranged to form therebetween substantially vertically extending joints extending substantially parallel to the plane of the brickwork;

each two neighboring vertical brickwork rows containing therebetween bearing joints;

insulating layers formed of insulating material being arranged in said vertically extending joints and located parallel to the brickwork plane and between said bricks;

the insulating layers of at least one bearing joint extending up to neighboring bricks;

the bricks neighboring the insulating layers in vertical direction are conventional hollow bricks having continuous holes extending from bearing joint side to bearing joint side;

at least predetermined ones of the holes neighboring the insulating layers being filled with insulating material; and

the insulating layer of the vertical joints connect at least at one bearing joint side with the insulating material in the holes of the bricks.

4,312,165

BRACKET FOR HEAD OF PANEL FASTENER

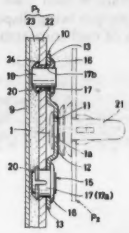
Akira Mizusawa, Fujisawa, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Sep. 26, 1979, Ser. No. 78,987

Claims priority, application Japan, Oct. 3, 1978, 53-135104[U]

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—511 **2 Claims**



1. As assembly of a panel to a support wherein said panel includes a laminate of an outer trim surface member, an intermediate locally weak plastic material and a semi-rigid backing member having a predetermined thickness, said backing member having a plurality of apertures each of which communicates coaxially with a blind bore in said plastic material having an axial extent less than the thickness of said plastic material, at least one bracket attached to said panel, rivets for fastening said bracket to said panel, and at least one panel fastener held by each said bracket and securing said panel relative to said support, each said bracket comprising a substantially rigid seat portion spaced from said backing member and apertured base plate portions have a predetermined thickness in intimate contact with the backing member, each of the apertures in said base portion being aligned with an aperture in said backing member, each of said rivets including a head, a shank, a through bore extending through said head and shank, and a drive pin, said hollow shank being bifurcated to provide at least two moveable legs each of which adjacent its free end carries radially outwardly extending shoulder means, said shoulder means being spaced from said head a distance substantially equal to the sum of the predetermined thicknesses of said bracket and said backing member, whereby when the pin is axially driven between said legs said shoulder means are moved laterally into said weak plastic to thereby accomodate said shoulder means in underlying relation to said backing member in opposition to said head without distortion of said trim surface member, said at least one panel fastener including head means cooperating complimentarily with said bracket seat and said fastener further including snap engaging shank means engaging said support to retain said panel relative to said support without distortion of said trim surface member.

4,312,166

WALL ASSEMBLIES

Donald E. Mock, Azusa, Calif., assignor to Anjac Plastics, Inc., El Monte, Calif.

Filed Mar. 6, 1980, Ser. No. 127,584

Int. Cl.³ E64G *11/08*; E04C *2/32, 2/38*

U.S. Cl. 52—522 **1 Claim**

1. A wall assembly including a series of at least two panels located in side edge to side edge relationship, each of said panels having a front and a back, each of said panels having a first edge and a first connecting means extending along the length of its first side edge and each of said panels having a second side edge and a second connecting means extending along the length of its second side edge, side edges of said panels in said assembly being connected by engagement be-

tween first and second connecting means on adjacent of said panels, in which the improvement comprises:

each panel including a back wall adjacent to its first side edge and a positioning wall connecting to its back wall and spaced from its first side edge and including a second positioning wall leading from its second side edge,

said first and second connecting means, said back wall, and said first and said second positioning walls on each of said panels being of uniform cross-sectional configuration along their lengths,

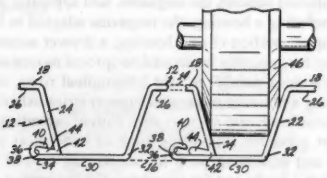
said first positioning wall on each of said panels extending parallel to the first side edge of such panel and being spaced from said first side edge of such panel by said back wall and sloping outwardly from the back of such panel,

said first connecting means on each of said panels comprising a retaining flange extending generally away from said back wall at said first edge of such panel generally toward the front of such panel and then along the back wall of such panel so as to overlay said back wall of such panel to define an elongated retaining opening,

said second positioning wall on each of said panels extending from said second side edge of said panel toward the front of such panel and sloping outwardly from the back of such panel,

each of said retaining openings is of larger cross-sectional dimension internally than it is adjacent to its entrance,

said second connecting means on each of said panels comprising a retained flange extending from said second side edge of such panel at an extremity of said second positioning wall of such panel generally toward said first side edge of such panel,



said retained flanges having rounded edges being capable of being pushed into said retaining openings so as to connect adjacent of said panels into side edge to side edge relationship with one another,

each of said retained flanges is shaped so as to conform to the shape of said internal openings,

said first and said positioning walls on each of said panels being sloped from adjacent to the back of such panel to adjacent to the front of such panel at an acute angle with respect to one another,

said positioning walls being sloped with respect to one another so as to permit two of said panels to be assembled with respect to one another by placing the retained flange on one of said panels on said back wall of the other of said panels adjacent to the retaining opening on the other of said panels so that as a downward pressure is applied to the positioning walls adjacent to the so located panels a force component will be exerted which forces the retained flange on the first of such panels into engagement with the retaining flange within said retaining opening on the other of said panels,

said panels are formed of a somewhat resilient material capable of being temporarily deformed so as to permit said retained flanges to be snapped into said retaining openings,

adhesive means located between said retained flanges and the interiors of said retaining openings.

4,312,167

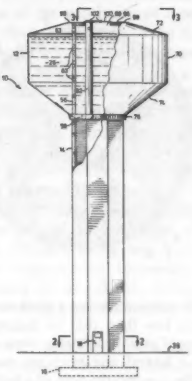
METHOD OF CONSTRUCTING A STORAGE TANK

Laurence G. Cazaly, 82 Green La., Thornhill, Ontario, Canada (L3T 2A1), and Douglas Lamon, 494 Wentworth St. N., Hamilton, Ontario, Canada (L8L 5W9)

Filed Jun. 9, 1980, Ser. No. 157,428

Int. Cl.³ E04H *12/30*

U.S. Cl. 52—745 **20 Claims**



1. A method of constructing an elevated liquid storage tank, the method comprising:

erecting an upright, cylindrical, reinforced concrete shell having a base portion located generally at ground level and an upper distal portion located at the top of the upright shell;

fabricating concentrically about said base portion an annular steel tank, the tank defining floor and roof openings for the upright shell to pass therethrough;

raising the tank to the upper distal portion; and

constructing a reinforced concrete tank floor to sealingly close the tank floor opening and secure the tank in position at the upper distal portion of the upright shell.

4,312,168

METHOD AND DEVICE FOR PRESSING AND PLEATING OVERCAPPING CAPS OF THE FOIL TYPE ONTO BOTTLE NECKS

Albert Desom, 5, route de Stadtbredimus, Remich sur Moselle, Luxembourg

Filed Jan. 7, 1980, Ser. No. 109,918

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901169

Int. Cl.³ B67B *5/00, 3/12, 3/16*

U.S. Cl. 53—49 **7 Claims**

1. A device for pressing and pleating an overcapping foil cap on a bottle neck, comprising:

a rigid encompassing frame;

means defining first and second pairs of diametrically opposed pressure expandable chambers disposed within said frame and arranged to define a central passage for receiving a bottle neck, each of said chambers comprising at least an inner expandable resilient wall defining, integral therewith, a pad having an operative surface defining partially said central passage and shaped, in a rest condition, to substantially correspond to the partial shape in longitudinal and transversal directions of a bottle neck;

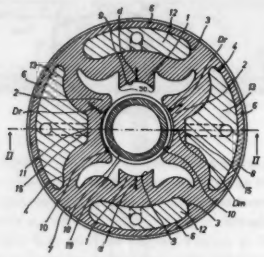
a first means for admitting simultaneously pressurized fluid into the chambers of said first pair for pressing the pads thereof onto the bottle neck;

a second means, independent of said first means, for admitting simultaneously pressurized fluid into the chambers of

said second pair for pressing the pads thereof onto the bottle neck,

the pads of said first pair having, in transversal cross-section, a substantially constant thickness along their operative surfaces which is delineated laterally by substantially angular edges to initiate pleat formation in a cap when pressed onto a bottle neck,

the pads of said second pair having, in transversal cross-section, a middle portion having a thickness along their operative surfaces less than that of the opposite lateral end portions thereof which delineate their operative surfaces, whereby said lateral end portions may expandably circumferentially overlap the area of a bottle neck pressed by the pads of said first pair when the pads of said second pair are pressed onto said bottle neck with the pads of said first pair separated therefrom so as to lap the pleats previously formed in said caps by the pads of said first pair.

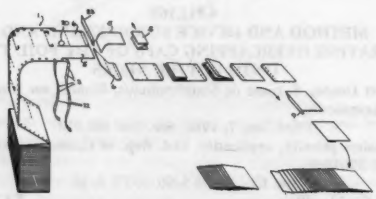


4,312,169

MECHANISM FOR MAKING AN ENVELOPE AROUND AN INSERT

Roman M. Golicz, Clinton; William H. Gunther, Jr., Mystic, and James W. Hough, Madison, all of Conn., assignors to G.B.R., Ltd., Dover, Del.

Filed Feb. 19, 1980, Ser. No. 122,278
Int. Cl.³ B65B *11/48*
U.S. Cl. 53—206 **20 Claims**



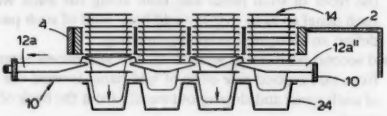
1. A mechanism for forming an envelope, comprising a composite sheet which includes a predetermined envelope assembly and a predetermined letter insert assembly connected together in adjacent transverse relationship to each other, means for moving said composite sheet in a lengthwise direction, means for severing said composite sheet lengthwise between said letter insert assembly and said envelope assembly, means for severing said composite sheet transversely to separate the two assemblies into individual and separate letter and envelope assemblies, means for moving the said individual envelope assembly along one path and for moving the said individual letter insert assembly along another path, means for relative positioning of the said predetermined letter insert assembly in superimposed relationship to the said predetermined envelope assembly, said means for moving said envelope assembly including means for causing said letter insert assembly to be deposited on top of said moving envelope assembly, means for folding said envelope assembly around said letter insert assembly and means for sealing the edges of said envelope assembly.

4,312,170

ARRANGEMENT FOR DISPENSING PROPAGATION POTS, ETC.

Ake Berg, Tjodalying, and Marius Gundersen, Larvik, both of Norway, assignors to Vefi A/S, Larvik, Norway

Filed Dec. 5, 1979, Ser. No. 100,407
Claims priority, application Norway, Dec. 5, 1978, 784087
Int. Cl.³ B65B *5/08*; B65H *3/44*; B65G *59/06*
U.S. Cl. 53—247 **3 Claims**



1. In an apparatus for dispensing open-topped containers or pots from plural stacks of nested pots, each pot having an outwardly extending rim, the stacks being arranged in a magazine in plural longitudinal rows and plural transverse rows, and the pots being dispensed from the stacks into a tray adapted to be positioned beneath the magazine, said apparatus being of the type including a housing, the magazine adapted to be installed in an upper portion of said housing, a drawer mounted in said housing for generally horizontal reciprocal movement in opposite directions parallel to said longitudinal rows, said drawer including a plurality of parallel support strips extending in said directions, each said support strip having extending therefrom support parts for supporting rims of lowermost pots of the stacks and separating parts for supporting rims of lowermost pots of the stacks and for separating the lowermost pots of the stacks upon movement of said drawer, said support parts having upper edges at a level below the level of upper edges of said separating parts, said support parts and separating parts of each said support strip being displaced with respect to each other in said directions, the improvement wherein:

each said separating part has a pointed end facing a longitudinally adjacent said support part; and

each said support part has a pointed end formed by a downwardly inclined edge extending in an overlapping manner beneath said pointed end of said separating part.

4,312,171

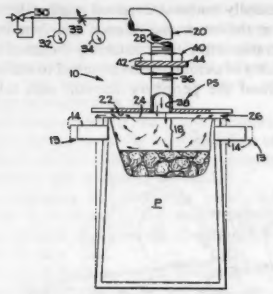
METHOD AND APPARATUS FOR PURGING AIR FROM CONTAINERS

Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 24, 1980, Ser. No. 110,652
Int. Cl.³ B65B *31/02*
U.S. Cl. 53—403 **14 Claims**

1. A flow control apparatus for purging air from a product filled container when one end of the container is open, said apparatus comprising a flow control valve having an apertured flat flow control surface positioned adjacent said open end of the container to overlap the open end while being spaced about $\frac{1}{8}$th of an inch therefrom, and means for directing a neutral air purging gas at a pressure of between about 1–2 inches of water through said aperture into the open end of the container for

creating a gentle non-turbulent flow of air and other gases out of the container along an unobstructed balanced flow path



defined between the periphery of the open end of the container and said flat flow control surface.

4,312,172

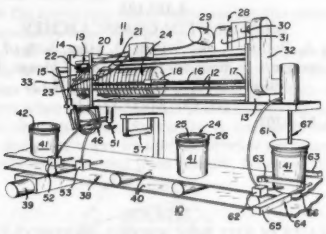
AUTOMATIC LID PLACING APPARATUS FOR LARGE PLASTIC LIDS AND METHOD FOR PLACING LIDS

Warren Fisher, and Frank J. Smith, Jr., both of Bricktown, N.J., assignors to United States Gypsum Company, Chicago, Ill.

Filed Mar. 14, 1980, Ser. No. 130,316

Int. Cl.³ B65B *7/28;* **B67B** *3/062, 3/22, 3/26*

U.S. Cl. 53—489 **27 Claims**



1. An apparatus for automatically placing large plastic lids which comprises:

a magazine section capable of storing juxtaposed plastic lids, said magazine section having lid advancing means comprising at least one threaded rod for advancing an engaged platen and thereby push lids to advance along lid support portions extending between plate members;

said threaded rod supported at opposite ends and seated in bearings permitting rotation, said magazine section having a compression portion for holding lids tightly facilitating discharge of only one lid at a time, said compression portion including lid discharging means;

drive means comprising a motor and cooperative brake and clutch assembly controlling rotation of a threaded rod to effect advancement of plastic lids and facilitate discharge of one lid at a time;

slide means for receiving lids discharging from the magazine section, said slide means comprising an inclined plate capable of receiving falling lids and allowing lids to slide downwardly to a lower portion thereof, stop means extending from said inclined plate for retaining lids wherein a portion of a lid extends beyond said inclined plate, said slide means associated with electric eye means capable of detecting a lid retained by said stop means and signalling said brake and clutch assembly of the drive means to disengage the motor upon detection of a lid reaching the retained position and capable of signalling said brake and clutch assembly to re-engage the motor when a lid is not retained;

conveyor means including conveyor drive means activating a moving horizontal surface for advancing pail receptacles, said conveyor means disposed below the slide means a sufficient distance whereby upper rim portions of pail receptacles encounter said portion of a retained lid extending beyond the lower portion of the slide means, whereby a leading edge of the upper rim of a pail receptacle encounters said extending portion of the lid and draws a lid off said stop means from retained position to dispense atop a pail rim;

guiding means to guide a dispensing lid onto a pail receptacle, said guiding means comprising a roller supported by hinged arms, said roller disposed adjacent said slide means and positioned for rolling contact across upper surfaces of a lid to guide a lid onto a pail receptacle as it dispenses from the slide means;

air cylinder and piston means for pre-setting lids on pails, said air cylinder and piston means cooperative with switch means disposed along the conveyor means, the switch means triggered by advancing pail receptacles thereby activating the air cylinder and piston means to tap a lid into pre-set engagement along the upper rim portion of a pail receptacle;

lid leveling means for positioning pre-set lids on pail receptacles, said lid leveling means comprising a horizontally fixed roller adjacent said air cylinder means, said roller positioned at a height sufficient to rotate and contact across upper surfaces of advancing lids thereby leveling in generally horizontal disposition;

lid securement means for final lid placement comprising pail receptacle detaining means cooperative with an air cylinder and piston assembly, said lid securement means activated in response to switch means triggered by an advancing pail receptacle, whereby said pail receptacle detaining means is capable of momentarily detaining a pail receptacle on the conveyor means in registry with said piston whereupon said air cylinder is sequentially activated causing said piston to descend and press atop a lid to place it firmly atop a pail receptacle; and,

electrical circuit means correlating apparatus operations to automatically sequence lid advancement by controlling engagement of the magazine drive means by means of said brake and clutch assembly activating in response to the electric eye means and by controlling the conveyor drive means and magazine drive means in response to the platen advancing in the magazine to trigger a shut-off switching means adapted to de-energize said conveyor drive means and magazine drive means thereby facilitating re-loading of the magazine section;

wherein said automatic lid placing apparatus facilitates sequentially affixing large plastic lids on pail receptacles.

4,312,173

APPARATUS FOR BUNDLING RODS, TUBES, SECTIONS, ETC.

Richard Killermann, Röthenbach, Fed. Rep. of Germany, assignor to Kabelmetal Messingwerke GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,387

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726305

Int. Cl.³ B65B *27/10*

U.S. Cl. 53—556 **3 Claims**

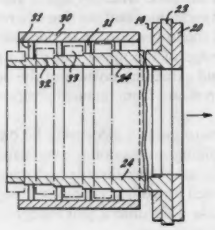
1. Apparatus for bundling rods, tubes, sections, or the like, comprising:

means for assembling the rods, tubes, or sections into a pile-like bundle;

a hollow mandrel including axially extending prongs being provided with steps and mounted for radial movement

and displacement relative to each other, the steps carrying expanded elastic rings;

means for providing the radial displacement of said prongs; means for passing the bundle through the mandrel; and



a tubular member disposed for movement relative to the mandrel and having protrusions for engaging the rings and stepwise moving the rings along and off the steps of the mandrel to be seated onto the bundle as passing through.

4,312,174

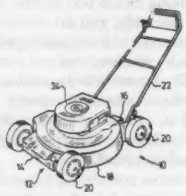
ROTARY LAWN MOWER

John Vanderhoef, Winnipeg, Canada, assignor to Canadiana Garden Products Inc., Brampton, Canada

Filed Jun. 18, 1980, Ser. No. 160,610

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—320.2 **17 Claims**



1. A rotary lawn mower adapted for multiple uses comprising a housing including a topwall and a pair of spaced apart skirt walls forming a toroidal cutting chamber, a cutting blade mounted for rotation within said cutting chamber, said cutting blade having oppositely directed air propelling surface portions formed to create a helical air current within the cutting chamber, said topwall being upwardly inclined at a small angle over an arc of between about 180° to about 270° terminating adjacent the end of the cutting zone of the cutting chamber, and abruptly downwardly inclined over an arc of between about 20° to about 45° commencing adjacent the end of the cutting zone, the outer of said skirt walls having a side discharge opening therein adjacent the end of the cutting zone, the topwall having an arcuately elongated opening therein separate from the opening in the skirt wall extending over an arc of at least about 90° terminating adjacent the end of the cutting zone, and means for selectively closing said discharge openings.

4,312,175

AGRICULTURAL ROTARY MOWERS

Stephen J. Barnes, 51 Roy St., Palmerston North, New Zealand

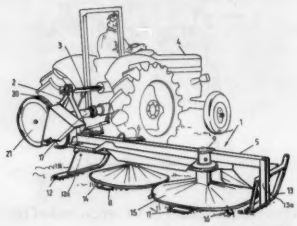
Filed Feb. 6, 1979, Ser. No. 9,945

Claims priority, application New Zealand, Feb. 10, 1978, 186438

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—16.2 **5 Claims**

1. An agricultural rotary mower comprising a primary frame, mounting means in said primary frame to engage the three point linkage assembly of a tractor, a rotor supporting beam supported from and extending to one side of said primary frame, two spindles dependant from said rotor supporting beam in substantially horizontal spaced relationship, a ground engaging skid at the lower end of each said spindle, a frusto-conical blade transporting rotor rotatably mounted upon each spindle, a plurality of cutting blades attached to each said rotor to project beyond the periphery thereof, said rotors being



arranged so that in use they make a single cutting path, the axes of rotation of said rotors being inclined towards one another so that the cutting height of each rotor at approximately the middle of said cutting path is less than the cutting height at the outer edges of said cutting path and drive means connecting the rotors to the power take off of the tractor to drive the rotors in counterrotation towards one another at their leading edges with respect to the line of cut.

4,312,176

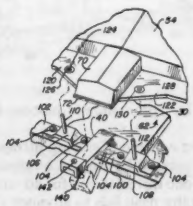
MOWER WITH GRASSCATCHER

William A. Bollinger, and Wilbur B. Hipp, both of Manning, S.C., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Nov. 5, 1980, Ser. No. 204,129

Int. Cl.³ A01D *35/22*

U.S. Cl. 56—202 **8 Claims**



1. In a mower of a type comprising

a deck, which includes a cutting chamber opening at a portal for discharge of cuttings rearwardly from the cutting chamber,

a door, which has an upper edge where the door is mounted pivotedly to the deck near an upper margin of the portal for pivotal movement between a position wherein the door closes the portal, as for operation of the mower without a grasscatcher, and positions wherein the door is pivoted upwardly and rearwardly from the portal,

an arm, which is integral to the door for pivotal movement with the door, and which extends upwardly when the door closes the portal,

means biasing the door and the arm toward the position wherein the door closes the portal, and

a grasscatcher, which has a rigid portion including a mouth conforming approximately in size and shape to the portal, which is attachable to the deck behind the portal so as to

receive cuttings from the cutting chamber through the mouth, and which is detachable from the deck,

wherein the rigid portion of the grasscatcher has an upper lip, which engages the arm so as to hold the door in a position wherein the door is pivoted upwardly and rearwardly away from the portal, through the mouth, and into the grasscatcher, and wherein the arm is pivoted downwardly and forwardly over the deck, when the grasscatcher is attached to the deck,

an improvement wherein the mower comprises

means projecting upwardly from a portion of the deck near the upper margin of the portal, the projecting means being integral to said portion of the deck,

means embracing the projecting means when the grasscatcher is mounted to the deck, the embracing means being integral to a portion of the grasscatcher near the upper lip, and

a block, which is integral to the arm, and which is adapted to cooperate with the upper lip when the grasscatcher is attached to the deck so as to restrain the grasscatcher from becoming detached unintentionally from the deck if the grasscatcher happens to be bumped from beneath, but so as to enable the grasscatcher to be detached from the deck by pivotal movement of the arm downwardly and forwardly over the deck beyond the position wherein the arm tends to be held by the upper lip and the biasing means,

whereby the grasscatcher can be attached easily to the deck and can be detached easily from the deck but is restrained so as not to become detached unintentionally from the deck as when the grasscatcher happens to be bumped from beneath, bounced, or lifted, and whereby an operator can ascertain visually whether the grasscatcher is attached effectively,

wherein the projecting means comprise parallel pins projecting upwardly from said portion of the deck,

wherein the embracing means comprise spaced openings, which are provided in the rigid portion of the grasscatcher near the upper lip, and through which the pins project when the grasscatcher is attached to the deck, and

wherein the pins project forwardly, as well as upwardly, so as to guide the upper lip into the block if the grasscatcher happens to be bumped from beneath, bounced, or lifted.

4,312,177

HEIGHT-CONTROL DEVICE FOR THE ELEVATABLE IMPLEMENT OF AN AGRICULTURAL HARVESTING MACHINE

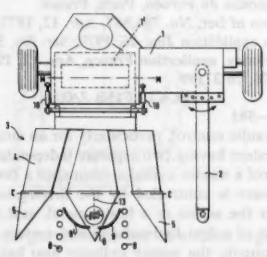
Martin Maier; Josef Pürrer, both of Gottmadingen, and Ronald Clemens, Allensbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,235

Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919123

Int. Cl.³ A01D *67/00*

U.S. Cl. 56—208 **9 Claims**



1. An agricultural crop harvesting machine comprising:

a machine frame formed with a crop processor and displaceable in a crop-harvesting direction of advance;

a crop pickup unit swingably mounted on said frame about a first axis generally transverse to said direction of advance whereby a leading end of said unit can be raised and lowered by swinging said unit about said first axis;

at least one hydraulic cylinder arrangement pivotally connected to said frame and to said unit at locations offset from said first axis;

at least one hollow point mounted at said end of said unit for pivotal movement about a second axis transverse to said direction of advance and riding on the ground whereby the pivotal movement of said point follows the ground contour; and

switch means responsive to the displacement of said point about said axis for controlling said hydraulic arrangement to raise and lower said unit to adjust the height thereof relative to the ground during crop harvesting, said switch means being disposed within said point, said point being provided with an elongated height sensor disposed in said point and actuating said switch means upon angular displacement of said point about said second axis, said sensor extending longitudinally in said point and passes through an opening formed in a rear wall thereof toward said unit, said unit being formed with at least one adjustable abutment surface engageable with said sensor for establishing a height reference therefor, said switch means includes a pair of switches disposed in said point and respectively assigned to issue "lift" and "lower" commands for said arrangement, said sensor being provided with a switch actuator movably mounted on the sensor and engageable with said switches selectively and spring means for resisting relative movement of said sensor and said actuator, said sensor is a rod and said spring means includes a first spring biasing said actuator against an abutment on said rod and seated against said rod at a location spaced from said abutment, and a further spring biasing said abutment in the direction opposite the effective direction of the first spring.

4,312,178

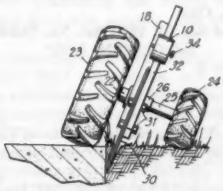
LAWN EDGING MACHINE

Allie Callahan, 232 Jeff Davis Rd., Thomaston, Ga. 30286

Filed Jan. 19, 1981, Ser. No. 226,073

Int. Cl.³ A01D *53/14*

U.S. Cl. 56—256 **9 Claims**

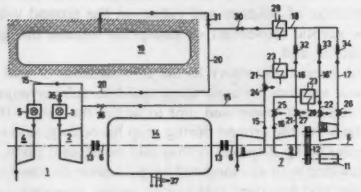


1. An edging machine comprising a frame including guiding handle means for use by a walking attendant, an axle means supporting the frame, spaced ground wheels of unequal size on the axle means, the axle means including adjusting means whereby axial spacing of said wheels on the axle means may be varied, power drive means on the frame coupled with the axle means and driving the larger of said ground wheels in rotation, and an edging blade carried by said frame near and inwardly of said larger ground wheel and rearwardly of the axle means.

4,312,179
GAS TURBINE POWER PLANT WITH AIR RESERVOIR AND METHOD OF OPERATION

Paul Zaugg, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Mar. 30, 1979, Ser. No. 25,574
Claims priority, application Switzerland, May 8, 1978, 4924/78
Int. Cl.³ F02C 7/26
U.S. Cl. 60—39.02 **4 Claims**



1. A method of starting a power plant and charging an air reservoir, the power plant having a motor-generator, a compressor with a low-pressure section, a medium-pressure section and a high-pressure section, a turbine with a high-pressure section and a low-pressure section, a combustion chamber, an auxiliary motor and an empty air reservoir cell, comprising the steps of:

driving the compressor with the auxiliary motor to compress air;

conducting compressed air from the low-pressure compressor section through the combustion chamber to the low pressure turbine section;

igniting fuel in the combustion chamber when a timing speed is attained;

accelerating the power plant to a predetermined speed at which the motor-generator operates at a line frequency;

switching the motor-generator onto a power line when the line frequency has been attained;

disconnecting the turbine from the motor-generator;

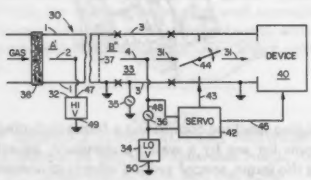
driving the motor-generator with power from a power line;

sequentially connecting the medium-pressure compressor section and the high-pressure compressor section in fluid communication with the low-pressure compressor section and the air reservoir cell depending upon the pressure level of the air reservoir cell.

4,312,180
DETECTING PARTICLES

Robert B. Reif, Grove City, and Loren R. Albrechtson, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Sep. 28, 1979, Ser. No. 79,866
Int. Cl.³ F02C 7/052
U.S. Cl. 60—39.09 R **14 Claims**



1. Apparatus for detecting the presence of more than a negligible concentration of dust or other particles in a moving stream of gas comprising

first and second electrically conductive members spaced apart in a first region of the stream, and positioned substantially coaxially with the stream, means for providing thereto electrical potentials sufficiently different to provide a potential gradient of at least about 30 kilovolts per centimeter in a limited region adjacent to the surface of one of the conductive members, to provide a corona and thus to produce ions that charge a substantial proportion of any particles in the gas passing through the first region, and

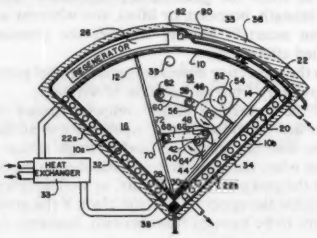
passive means in a second region of the stream that is downstream from the first region, for detecting the presence of a detectable concentration of charged particles in the gas while present in the second region,

the passive means comprising third and fourth electrically conductive members spaced apart in the second region, and positioned substantially coaxially with the stream, means for providing thereto electrical potentials of such difference as to provide a potential gradient of substantially less than about 30 kilovolts per centimeter therebetween, and means for detecting any measurable current flowing to the third or the fourth member.

4,312,181
HEAT ENGINE WITH VARIABLE VOLUME DISPLACEMENT MEANS

Earl A. Clark, 1143 Manchester Ave., Norfolk, Va. 23508

Filed Jun. 14, 1979, Ser. No. 48,427
Int. Cl.³ F02G 1/04
U.S. Cl. 60—519 **33 Claims**



1. In a Stirling cycle device having means defining a working chamber of constant volume, the improvement comprising first and second means disposed within said chamber and defining with said chamber first, second and third regions each of variable volume said first and second means and said means defining said working chamber sealing said first and second regions to prevent the ingress or egress of fluid thereto or therefrom.

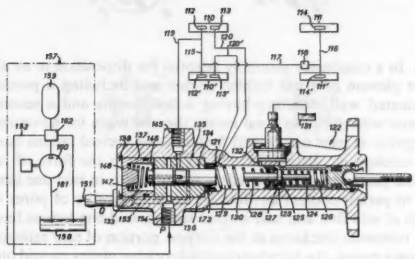
4,312,182
HYDRAULIC CONTROL FOR AUTOMOBILE BRAKES

René G. Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Continuation of Ser. No. 786,867, Apr. 12, 1977, abandoned.
This application Jun. 26, 1979, Ser. No. 52,234
Claims priority, application France, Apr. 12, 1976, 76 10641; Dec. 10, 1976, 76 37199
Int. Cl.³ F15B 7/00
U.S. Cl. 60—581 **17 Claims**

1. A hydraulic control, particularly for an automobile vehicle brake system having two separate independent circuits, in which control a master cylinder comprises a first chamber in which pressure is controlled by the driving-in of a master piston under the action of a brake pedal, said first chamber forming part of a first hydraulic closed system comprising a first brake circuit, the master cylinder also having a second pressure chamber forming part of a second closed system comprising a second brake circuit, the said second chamber

being adapted to be fed by a source of fluid pressure, the said master cylinder being provided with a plunger comprising a valve that controls said source of fluid pressure and whose two opposite faces are subjected respectively to the pressures of the two closed systems, the master piston being disposed in the first chamber coaxially with the plunger in such a manner as to permit mechanical intervention in the event of hydraulic failure in the first closed system, the plunger being mounted in a part accommodated in the body of the master cylinder, the master cylinder having a bore having a shoulder against which the said accommodated part is applied, an annular recess being formed on the first chamber side between the bore of the



master cylinder and the plunger, a seal inserted in the annular recess with an outer face applied against the bore of the master cylinder and an inner face applied against the plunger, means for holding the seal in the axial position, said means comprising a return spring for the master piston, the spring being interposed between the said master piston and the seal in such a manner as to hold the latter applied against the said accommodated part, the master piston cooperating on the one hand permanently with the said return spring, and on the other hand, in the event of the failure of the first closed system, after the master piston has been driven in, with a second spring acting between the master piston and the plunger in order to introduce modulating resistance simulating back-pressure.

4,312,183

EXHAUST GAS TURBOCHARGER FOR DIESEL ENGINES

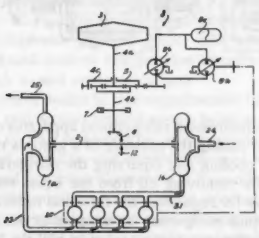
Karl N. Regar, Munich, Fed. Rep. of Germany, assignor to Man Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 75,915

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840375

Int. Cl.³ F02B *37/10*

U.S. Cl. 60—608 **4 Claims**



1. An exhaust gas turbocharger for a diesel engine, comprising:

(a) a turbocharger including a compressor, an exhaust gas turbine, and a shaft joining the compressor and turbine,

(b) a flywheel having a two-section flywheel shaft,

(c) a freewheel for alternatively coupling and uncoupling the flywheel shaft and turbocharger shaft,

(d) a summation mechanism between the two sections of the flywheel shaft,

(e) a hydrostatic device for controlling the output of the summation mechanism, the hydrostatic device including a pump adapted to be driven by the diesel engine, a hydromotor for driving the summation mechanism, and a high pressure accummulator between the pump and hydromotor.

4,312,184

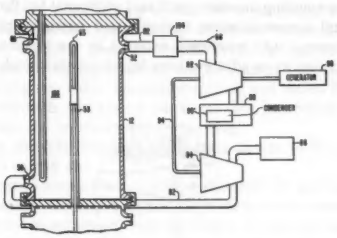
FLUID CIRCULATION SYSTEM FOR HEAT EXCHANGERS

James D. Mangus, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 603,076, Aug. 8, 1975, now Defensive Publication No. T954,001. This application Nov. 10, 1977, Ser. No. 850,441

Int. Cl.³ F28D *15/00*

U.S. Cl. 60—644.1 **9 Claims**



7. A nuclear reactor including a tertiary fluid and a tertiary fluid circulation system for heat exchangers having a shell portion, a first group of tubes through which a primary fluid flows, a second group of tubes through which a secondary fluid flows, said first and second groups of tubes being so positioned that a tube of one group is positioned between a plurality of tubes in the other group, and means for conducting heat positioned between said tubes, whereby a portion of the heat energy in the fluid in one group of tubes is transferred through said means for conducting heat to the fluid in the other group of tubes, said tertiary fluid circulation system comprising:

said shell having tertiary fluid inlet means and tertiary fluid outlet means;

said means for conducting heat having passageways from said tertiary fluid inlet means to said tertiary fluid outlet means;

means for connecting said tertiary fluid outlet means and said tertiary fluid inlet means, said connecting means including a turbine, said turbine producing useful energy and being cooperatively associated with means utilizing said energy to circulate said tertiary fluid from said tertiary fluid inlet means, through said passageways in said means for conducting heat, through said tertiary fluid outlet means, and back to said tertiary fluid inlet means.

4,312,185

LOW PROFILE FUEL INJECTION SYSTEM

Dudley O. Nash, Cincinnati, and Glenn L. Knight, Jr., Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 19, 1980, Ser. No. 122,622

Int. Cl.³ F02K *3/10*

U.S. Cl. 60—739 **18 Claims**

10. In a turbofan engine having a thrust augmenter including

a generally annular casing, a generally annular forward liner spaced radially inward from said casing, a generally annular mixer spaced radially inward from said liner, an annular cooling duct between said casing and said liner, an annular fan flow duct between said liner and said mixer, and a core flow duct within said mixer, a low profile fuel injection system for the augmenter comprising:

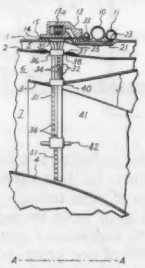
(a) a fan fuel manifold extending circumferentially on and secured with the outer surface of the augmenter casing for receiving fuel under pressure from a fuel source, and communicating through said casing with a plurality of fan flow channels in fan fuel connecting members secured with the inner surface of said casing;

(b) a plurality of fan injector valve heads including fuel metering means spaced circumferentially and mounted on the outer surface of said casing, each said fan injector valve head communicating through said casing with:

(i) at least one of said fan flow channels;

(ii) at least one fan injector tube having a plurality of spray orifices and extending generally radially from said fan injector valve head through an opening in the forward liner into the fan flow duct; and

(iii) at least one additional fan flow channel in said fan fuel connecting member, each said additional fan flow channel communicating through said casing with a fuel jumper tube extending external to the surface of said casing to an adjacent core injector valve head;



(c) a core fuel manifold extending circumferentially on and secured with the outer surface of said casing, for receiving fuel under pressure from a fuel source and communicating through said casing with a plurality of core flow channels in core fuel connecting members secured with the inner surface of said casing; and

(d) a plurality of core injector valve heads, including fuel metering means spaced circumferentially and mounted on the outer surface of said casing alternately with said fan injector valve heads, each said core injector valve head communicating through said casing with at least one of said core flow channels and with at least one core injector tube having a plurality of spray orifices and extending generally radially from said core injector valve head through openings in said forward liner and the mixer into the core flow duct, each said core injector valve head further including at least one fan injector tube, having a plurality of spray orifices and extending generally radially through an opening in said forward liner into said fan flow duct from said core injector valve head, each said fan injector tube extending from said core injector valve head and communicating therein with an additional fan flow channel in said core fuel connecting member, each said additional fan flow channel in said core fuel connecting member communicating through said casing with said fuel jumper tube.

4,312,186

SHINGLED LAMINATED POROUS MATERIAL

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1979, Ser. No. 85,603

Int. Cl.³ F02C *3/14*; F23R *3/42*

U.S. Cl. 60—754 **3 Claims**

1. In a combustor assembly adapted for disposition in an air inlet plenum of a gas turbine engine and including a porous laminated wall structure having a first lamina and a second lamina with diffusion bond means therebetween for structural integrity, at least one of said first and said second lamina having coolant air distribution means therein in the form of relieved passage means of predetermined depth in said one lamina to permit coolant air flow between a plurality of pores in each of said first and said second lamina, said one lamina having minimum thickness at the deepest portion of said relieved passage means, the improvement comprising means on said one lamina defining a pattern of interconnecting stress relief grooves which cooperate with said relieved passage means in defining crack sections coextensive with said relief grooves and, having depth less than said minimum thickness so that thermal stress induced by a temperature gradient across said wall structure is concentrated at said crack sections to fracture said one lamina thereat into a plurality of separate shingles thereby preventing excessive stress formation in said wall structure.

4,312,187

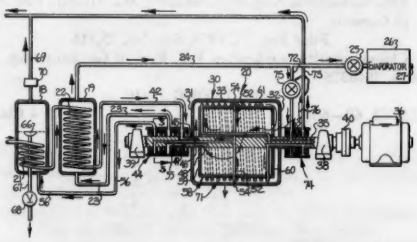
METHOD AND APPARATUS FOR SEPARATING OIL FROM A REFRIGERANT

William E. Myers, Norwood, N.C., assignor to Lillian S. Myers, Norwood, N.C.

Filed Apr. 14, 1980, Ser. No. 140,164

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—84 **12 Claims**



1. A vapor compression refrigeration apparatus comprising a compressor for raising the pressure of a gaseous refrigerant, a condenser for cooling and liquifying the refrigerant, oil separating means for removing oil from the liquid refrigerant, an expansion valve for regulating the flow and reducing the pressure of the liquid refrigerant, an evaporator for transferring heat from the substance being cooled to boil the low pressure liquid refrigerant, and conduit means for serially directing the refrigerant through said components, the improvement wherein said oil separating means comprises driven rotatable means for continuously centrifuging the liquid refrigerant passing therethrough to separate the oil from the refrigerant.

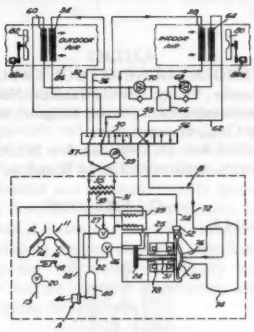
4,312,188
HEAT PUMP SYSTEM

Paul F. Swenson, Cleveland, Ohio, and Paul B. Moore, Fedhaurn, Fla., assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 845,229, Oct. 25, 1977, Pat. No. 4,178,772, which is a continuation-in-part of Ser. No. 737,776, Nov. 1, 1976, Pat. No. 4,055,964. This application Nov. 7, 1979, Ser. No. 91,881

Int. Cl.³ F25B *13/00, 1/00*

U.S. Cl. 62—160 **1 Claim**



1. An indoor space heating and cooling system comprising:

a refrigeration circuit having, in series relationship, a compressor and separate indoor and outdoor refrigeration circuit heat exchangers;

a heat engine for driving said compressor while rejecting heat;

a supplemental heat distribution circuit having indoor and outdoor rejected heat exchangers and means for conducting heat rejected from said heat engine to one or the other of said rejected heat exchangers;

first control means in said refrigeration circuit, said first control means being selectively settable to a cooling condition for directing refrigerant from said compressor first through said outdoor and then through said indoor refrigeration circuit heat exchangers and back to said compressor or to a heating condition for directing refrigerant from said compressor first through said indoor and then through said outdoor refrigeration circuit heat exchangers and back to said compressor; and

second control means in said supplemental heat distribution circuit, said second control means being selectively settable to a cooling condition for directing rejected heat from said heat engine to said outdoor rejected heat exchanger when said first control means is in its cooling condition or to a heating condition for directing rejected heat from said heat engine to said indoor rejected heat exchanger when said first control means is in its heating condition, said heat engine being of a type employing throughout its cycle a gas as its working fluid and wherein the working temperatures of such gas are substantially higher than the temperature desired to be maintained in the indoor space conditioned by said system.

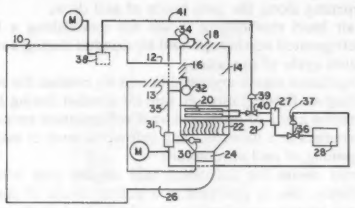
4,312,189
AIR CONDITION SYSTEM CONTROLLED RESPONSIVE TO THE ABSOLUTE HUMIDITY OF AIR IN A DESIGNATED TREATED SPACE

Worth B. Cotton, Jr., Greensboro, N.C., assignor to Industrial Air, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 914,028, Jun. 9, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,690

Int. Cl.³ F25D *17/04;* **F24F** *3/14;* **B01F** *3/02*

U.S. Cl. 62—176 C **6 Claims**



1. In an air conditioning system for a precribed area said system being of the type including a fresh air/return air mixing chamber; separate dampers for the fresh air and return air inputs into the mixing chamber; and air washer with associated pump and spray valve; eliminator section; and means for moving air through said system back into said prescribed area as supply air; the improvement comprising:

(a) an absolute humidity monitoring device in the path of said supply air;

(b) control means for modulating said fresh air and return air dampers responsive to said absolute humidity monitoring device to achieve a fresh air/return air mix that results in the maintenance of a constant absolute humidity level;

(c) a dry bulb temperature sensing device in said prescribed area; and

(d) a throttling means associated with said spray valve and connected to said temperature sensing device for increasing and decreasing the water flow through the spray nozzles of said air washer responsive to temperature fluctuations in said prescribed area.

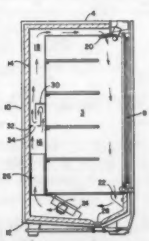
4,312,190
GLASS DOOR MERCHANDISER WITH HEAT TRAP

Fayez F. Ibrahim, Niles, and Arthur Perez, Buchanan, both of Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Sep. 26, 1979, Ser. No. 78,917

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—255 **22 Claims**



1. A refrigerated display case having a display section therein comprising:

a cabinet having top, bottom rear and side walls and an access opening in one of said walls;

at least one door covering said access opening, said door being movable for enabling access through said access opening to products within said display section of said display case;

an air conduit extending around said cabinet and having an outlet opening at one end of said access opening of said cabinet and an inlet opening at the opposing end of said access opening of said cabinet, said outlet opening and said inlet opening being arranged in alignment so that air leaving said outlet opening during a refrigeration cycle of operation will be directed towards and received by said inlet opening for forming an air curtain across said access opening along the path inside of said door;

an air band establishing means for establishing a flow of refrigerated air through said air conduit during a refrigeration cycle of operation;

refrigeration means arranged in said air conduit for refrigerating air flowing through said air conduit during a refrigeration cycle of operation, said refrigeration means being arranged at a location lying below the level of said outlet opening of said air conduit;

defrost means for defrosting said display case when said display case is operated in a defrost cycle of operation, said defrost means terminating the flow of air through said air conduit, terminating the operation of said refrigeration means and causing the application of heat to said refrigeration means during a defrost cycle of operation; and,

heat trap means arranged within said air conduit subsequent to the location of said refrigeration means along the air flow path so that the portion of said air conduit downstream of said heat trap is substantially thermodynamically isolated from the portion of said air conduit upstream of said heat trap for preventing the flow of heat by convection to said display section of said display case during a defrost cycle of operation.

4,312,191

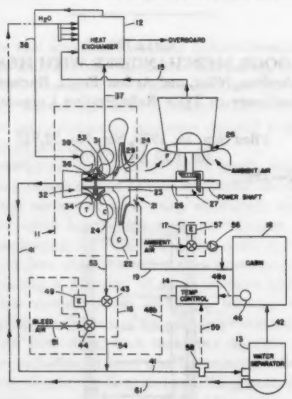
ENVIRONMENTAL CONTROL SYSTEM FOR AIRCRAFT WITH IMPROVED EFFICIENCY

Guido Biagini, Cherry Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 15, 1980, Ser. No. 122,148

Int. Cl.³ F25D *9/00*

U.S. Cl. 62—402 **34 Claims**



1. An airconditioning control system for an enclosure, the environment of which is to be controlled, including in combination;

a rotary power supply,

a turbomachine including a power compressor for providing compressed air secured to a power shaft, said rotary power supply drivingly coupled to said power shaft to operate at a given speed; an expansion cooling turbine mounted on a shaft concentric to said power shaft,

means for directing a source of ambient air to and through a heat exchanger,

said power compressor coupled to said enclosure and through said heat exchanger to an input of the expansion cooling turbine to thereby draw air from said enclosure and deliver said compressed air to said expansion cooling turbine, said expansion cooling turbine operating at a different speed than said given speed of said power shaft, and

said expansion cooling turbine having an output coupled to said enclosure to deliver conditioned air which has been cooled to said enclosure.

4,312,192

BOREHOLE LOGGING TOOL CRYOSTAT

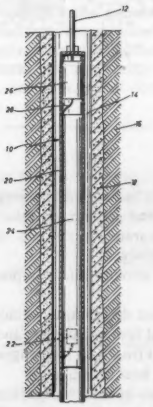
Alain Zarudiansky, Velizy; Sylvain Janssen, Neuilly, and Jean Tourret, Montrouge, all of France, assignors to Schlumberger Technology Corp., Houston, Tex.

Filed Jun. 19, 1980, Ser. No. 161,068

Claims priority, application United Kingdom, Jun. 21, 1979, 21750/79

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 R **24 Claims**



1. A cryostat for a high-sensitivity photon detector and adapted for use in a borehole logging tool, comprising:

an evacuable housing of generally tubular form;

an elongate single-phase heat sink of solid, thermally-conductive material disposed within said housing for thermal contact with a photon detector to be maintained at cryogenic temperatures;

means for establishing thermal contact between said heat sink and a cooling means separate from said cryostat, prior to use of the cryostat;

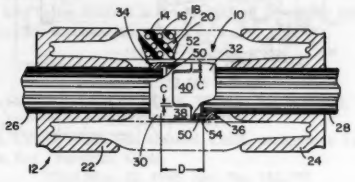
at least one rigid thermal shielding means made of a thermally-conductive material, disposed within and in a spaced relationship from said housing, said thermal shielding means disposed in a spaced relationship from said heat sink; and

the thermal shielding means and heat sink having substantially the same heat energy capacity, whereby said detector is maintained at cryogenic temperatures by absorption and retention of heat by said heat sink and thermal shielding means.

4,312,193
TORQUE TRANSFER DEVICE FOR FLEXIBLE SHAFT COUPLINGS

Ralph H. Gibbs, Boulder, and Robert E. Stuemky, Elizabeth, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Nov. 7, 1979, Ser. No. 92,115
Int. Cl.³ F16D *3/18*
U.S. Cl. 64—9 R **7 Claims**



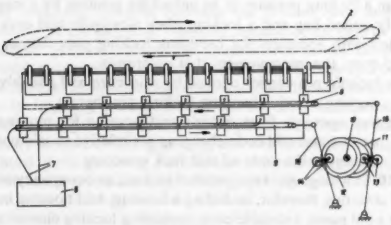
1. A torque transfer device for tubular, yielding element flexible shaft couplings comprising:

first and second sleeves which each have an internal diameter and opposite end portions, a ring of internal spline teeth projecting at one end portion that define a means for securing the sleeve from rotation relative to an end of the yielding element and circumferentially spaced jaw teeth, projecting from the opposite end portion and having a circumferential width less than the circumferential spacing to provide a desired clearance, the first and second sleeves always substantially coaxially arranged and adapted so that the jaw teeth interdigitate with each other in jaw coupling fashion.

4,312,194
METHOD AND ARRANGEMENT FOR NEEDLE SELECTION IN KNITTING MACHINES

Dietrich Cotte, Karl Marx Stadt; Holger Scheffler, Lichtenstein; Gunter Beyer, Limbach-Oberfrohna; Dietmar Bugge, Karl Marx Stadt, and Manfred Kühn, Lichtenstein, all of German Democratic Rep., assignors to VEB Wirkmaschinenbau Karl Marx Stadt, Karl Marx Stadt, German Democratic Rep.

Filed Jan. 30, 1980, Ser. No. 116,805
Claims priority, application German Democratic Rep., Feb. 19, 1979, 211066; Feb. 19, 1979, 211067
Int. Cl.³ D04B *7/00*
U.S. Cl. 66—75.2 **12 Claims**

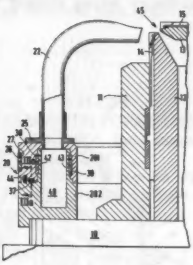


1. A method of selecting pattern-knitting needles in knitting machines having at least one stationary needle bed and a plurality of successively operating knitting systems travelling in a path, comprising the steps of providing electromechanical needle selectors; advancing said needle selectors in a track different from said path; and supplying needle-selecting signals to said selectors from a stationary control and via trailing cables when the selectors are moving in direction of the travelling knitting systems over at least a portion of said track which extends parallel to said path.

4,312,195
DUST-COLLECTING SYSTEM FOR CIRCULAR KNITTING MACHINE

Siegfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to Firma Sipra Patententwicklungs u. Beteiligungsgesellschaft mbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,162
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838178
Int. Cl.³ D04B *35/32*
U.S. Cl. 66—168 **14 Claims**



1. In a circular knitting machine having a needle cylinder and loop-forming instrumentalities operative for forming loops along an annular loop-forming zone, in combination, an annular channel-defining housing encircling the needle cylinder and located radially outwards of and lower than the annular loop-forming zone of the circular knitting machine, the annular channel-defining housing comprising an annular stationary housing part and an annular rotating housing part engaging with each other to form an annular suction channel, a source of suction connected to the suction channel, a plurality of suction nozzles mounted on the annular rotating housing part and communicating with the suction channel, the suction nozzles extending upwards from the annular rotating housing part to the annular loop-forming zone and having at their ends suction openings which are located radially outwards of and face the annular loop-forming zone, the annular rotating housing part being located on top of and riding on the annular stationary housing part, a drive belt entrained about the radially outer peripheral surface of the annular rotating housing part, a drive drum of squirrel-cage configuration comprised of a succession of bars, and guide rollers guiding the drive belt towards and away from the outer peripheral surface of the rotating housing part and around the drive drum.

4,312,196
GUIDEBAR SHOGGING GUIDE APPARATUS FOR WARP KNITTING MACHINES

Norbert Englert, Schaafheim, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,040
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926928
Int. Cl.³ D04B *23/00*
U.S. Cl. 66—207 **7 Claims**

1. A guidebar shogging guide apparatus for warp knitting machines having a guidebar, a needle bar with a plurality of equally spaced needles disposed thereon and a power driving source operatively coupled thereto, said shogging guide apparatus shogging said guidebar in predetermined increments parallel to said needle bar, comprising in combination:

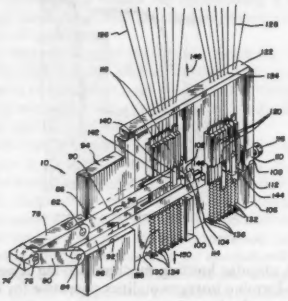
(a) at least one elongated slider bar means operatively coupled to said guidebar for moving said guidebar in a direction parallel to said needle bar;

(b) guide means operatively coupled to said slider bar means for providing incremental longitudinal displacements for

said slider bar means according to a predetermined program, said guide means including;

(i) a housing positioned to cooperate with and guide said slider bar means along its longitudinal axis, and

(ii) a plurality of setting elements disposed within said housing and transversely movable between a first position and a second position, the the number of elements being disposed in said first position being directly proportional to the displacement of said slider bar, the position of said setting elements being determined by a predetermined program, one of said setting elements being positioned to remain stationary in said first position, said stationary setting element being positioned



between a pair of setting elements, said pair of setting elements having a stepped portion, the thickness of the stepped portion of said pair of setting elements in the longitudinal direction being different from each other and from the remaining elements, said stationary setting element being thicker in the longitudinal direction than the stepped portion of said pair of setting elements preventing contact between said pair of setting elements when said stepped portions are juxtaposed with said stationary element therebetween; and

(c) programming means operatively coupled to all said movable setting elements for selectively positioning said setting elements in said first or said second position in accordance with said predetermined program.

4,312,197

DEVICE FOR PREVENTING OR EFFECTING THE UNLOCKING OF THE TRUNK LID OF AN AUTOMOBILE VEHICLE

Jean-Pierre Carrion, Courbevoie, and Christian Le Buhan, Elancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 11, 1979, Ser. No. 102,456

Claims priority, application France, Dec. 11, 1978, 78 34739; Jun. 18, 1979, 79 15498

Int. Cl.³ E05B *65/06*

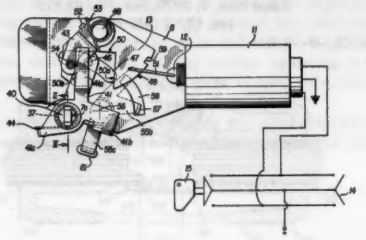
U.S. Cl. 70—135 **10 Claims**

1. A device for blocking or unlocking a closure of a vehicle, said device comprising:

release latch means for said closure;

a lock mounted on said closure, said lock including a rotatable knob and a bolt;

blocking lever means mounted on said plate and actuatable by said bolt and said knob, said blocking lever means being movable from an unblocking position wherein said blocking lever means transmits motion of said knob, to a blocking position wherein said blocking lever means is released from transmitting motion of said knob; wherein said knob engages a cylindrical knob body having a pin at one end, said pin contacting a first intermediate lever to activate said release latch means of said closure via said blocking lever means upon the rotation of said knob when said unblocking lever means is in said unblocking position, and wherein said bolt is concentric with said knob and includes a lock cylinder which is rotatable in one of two directions independently of said knob, wherein said bolt engages a second intermediate lever and the rotation of



said bolt causes said second intermediate lever to contact and move said blocking lever means into one of said blocking and unblocking positions, wherein said blocking lever means may also be actuated by a remote controlled driving organ.

4,312,198

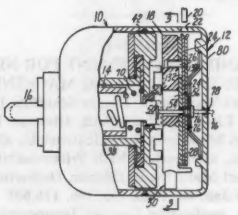
MAGNETIC KEY OPERATED HOTEL DOOR LOCK

Bruce S. Sedley, R.R. 1, Box 96, Kolos, Hi. 96756

Filed Aug. 9, 1979, Ser. No. 65,267

Int. Cl.³ E05B *13/10, 19/00, 35/08, 47/00*

U.S. Cl. 70—276 **20 Claims**



1. In a magnetic key actuated lock structure that includes a housing, a slidable core in said housing adapted to be translated from a locking position to an unlocking position by a magnetically coded key and a locking plate alongside said core provided with apertures for receiving locking pins therein from said core, the improvement that comprises:

a locking pin carrier carried by said core and slidably supporting a code changing locking pin therein,

a tool operable from outside said housing for moving said carrier and said code changing pin relative to said core for changing the code of said lock structure.

10. In a magnetic key operated lockset, an occupancy indicator structure therefor, including a housing, said housing including a tail piece, a slidable core containing locking elements, and a pair of plates between which a magnetic key may be inserted, the improvement that comprises:

first and second pins slidable axially of said structure,

said core being formed with an opening receiving said first pin therethrough,

said first pin being operatively connected to said tail piece for axial movement of said first pin upon depression of said tailpiece,

means mounting said second pin for axial movement in response to said axial movement of said first pin,

said housing having an outer wall adapted to receive one end

of said second pin therethrough upon depression of said tail piece,

one of said plates being provided with an opening for receiving said first pin therethrough for blocking the entry of such magnetic key when said tail piece is depressed.

14. A magnetic key for use with a magnetic key operated lockset which includes an occupancy indicator structure having an axially movable pin:

said key being formed with an opening for receiving said pin therethrough,

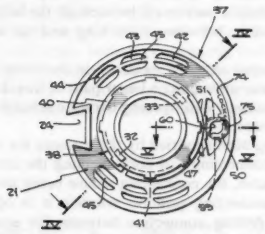
said key being formed in a plurality of separable parts for insertion seriatim in such lockset.

4,312,199

COMBINATION LOCK TUMBLER WHEEL CONSTRUCTION

Tim M. Uyeda, South San Gabriel, Calif., assignor to La Gard Lock, Inc., Torrance, Calif.

Filed May 22, 1980, Ser. No. 152,195
Int. Cl.³ E05B *37/00*
U.S. Cl. 70—316 **5 Claims**



1. A gate ring for a combination lock tumbler wheel, the gate ring having a central opening for receiving therein a drive member normally rotating with the gate ring to move a gate on the gate ring to different orientations whereby at one orientation a latch can move into the gate for unlocking the lock, securing means on the gate ring for normally preventing rotation of the gate ring with respect to the drive member and including a cam for alternatively releasing the securing means to permit rotation of the gate ring with respect to the drive member or returning the securing means to the normal position, the improvement in securing means comprising:

a flexible web on the gate ring extending adjacent the outside of the drive member, the flexible web having means for receiving the cam between the flexible web and a portion of the gate ring, whereby rotation of the cam to its normal position moves the flexible web to its normal position against the drive member and whereby rotation of the cam to its releasing position allows the web to move to its releasing position away from the drive member and where the gate ring is formed of plastic, the web in integrally formed on the gate ring, the web is located along a chord of the gate ring and the cam is located between the web and the outside edge of the gate ring.

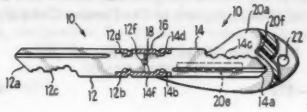
4,312,200

KEY CONSTRUCTION

Richard D. Thomas, 5816 W. 55th St., Chicago, Ill. 60638

Filed Jan. 17, 1980, Ser. No. 112,950
Int. Cl.³ E05B *19/04*
U.S. Cl. 70—408 **5 Claims**

1. A key construction comprising a pair of key shanks, each of which has a key bit adapted to engage different lock tumblers, key shank retaining means for rigidly supporting the key bits in aligned opposed relation to one another, and key bit receiving means pivotally mounted on the key shank retaining means whereby the key bits can be selectively and alternatively moved from an operative to an inoperative position, said key bit receiving means providing a finger gripping surface for



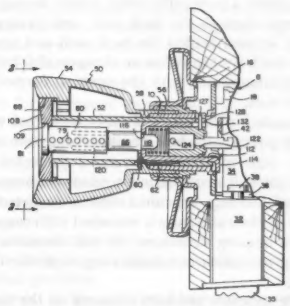
facilitating the engagement and the turning of said selected key bit in its respective different lock tumbler.

4,312,201

CYLINDER LOCK WITH FORCE-IMMUNE KNOB

William G. Roos, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Aug. 31, 1979, Ser. No. 71,666
Int. Cl.³ E05B *63/00*
U.S. Cl. 70—422 **4 Claims**



1. A cylinder lock having an outer knob structure adapted to function by key operation only and having a knob which functions as a handle only and not to retract the lock bolt,

said lock having a chassis including an outer hub, a knob sleeve mounted coaxially in said hub, and a locking lug locking the sleeve against rotation relative to the hub,

the outer end of the sleeve forming a core seat for the reception of a key-removable core having a central lobe containing a rotary key plug and having a laterally projecting pin tumbler housing, a roll-back cam carrier rotatably mounted in the knob sleeve, having a roll-back cam at its inner end for actuating a bolt retractor, and means for connecting the cam carrier for operation by the key plug of a core mounted in said core seat,

wherein the improvement comprises

a knob having a neck portion mounted for rotation on said hub and knob sleeve structure and having a hand-hold at its outer end formed with a large circular opening coaxial with the knob sleeve and adapted to pass the key-removable core to and from said core seat,

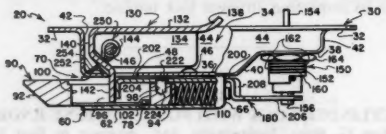
and means for closing said circular knob opening and supporting the outer end of the knob from the knob sleeve, said means including a face plate in said knob opening and having an inner opening surrounding a portion of the core so as to expose the key plug thereof for key insertion,

said closing and supporting means having a rotary slip fit at a peripheral face thereof which allows the knob to rotate freely under low turning force and thereby to render said lock immune to forcing by the application of high torque to said knob.

4,312,202
PADDLE LOCK WITH BOLT-CARRIED HANDLE DISCONNECT MEMBER

John V. Pastva, Jr., Parma Heights, and Albert L. Pelcin, Aurora, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 107,859
Int. Cl.³ E05B 55/10
U.S. Cl. 70—472 8 Claims



1. A flush-mountable door lock, comprising:

(a) a body structure having side and back walls which cooperate to define a forwardly-facing recess, having an opening formed through the back wall, and having housing structure located behind the back wall and cooperating with the back wall to define an elongate slidebolt passage which communicates with the opening formed through the back wall;

(b) an elongate bolt structure slidably supported within the slide bolt passage, the bolt structure being movable along a linear path of travel between a projected position wherein the bolt structure is extended with respect to the body and housing structures, and a retracted position wherein the bolt structure is retracted with respect to the body and housing structures, the bolt structure having a receiving formation communicating with the back wall opening;

(c) a handle structure pivotally mounted on the body structure and being movable about a first axis between a nested position wherein the handle structure is nested with respect to the recess, and an operating position;

(d) a projection carried by the handle structure and being movable therewith, and extending through the back wall opening into the slide-bolt passage and into the receiving formation of the bolt structure;

(e) disconnect linkage means having a first portion extending into the receiving formation for engaging the projection, and having a second portion extending longitudinally of the bolt structure through the slide-bolt passage and out one end of the slide-bolt passage toward the key-control means, the disconnect linkage means being pivotally mounted on the bolt structure and being pivotally movable relative to the bolt structure about a second axis between a connecting position wherein it is operable to drivingly connect the handle and bolt structures such that when the handle structure is moved out of its nested position the bolt structure is caused to retract, and a disconnecting position wherein no driving connection is provided between the handle and bolt structures;

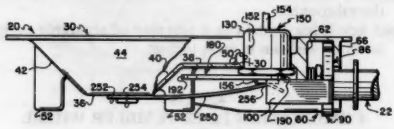
(f) key-control means carried by the body structure and including a locking member movable between locked and unlocked positions; and,

(g) the locking member being engageable with the second portion of the disconnect linkage means for moving the disconnect linkage means to its connecting position when the locking member is moved to its unlocked position, and for moving the disconnect linkage means to its disconnecting position when the locking member is moved to its locked position.

4,312,203
FLUSH-MOUNTABLE LOCK WITH ACTUATOR DISCONNECT FEATURE

Edwin W. Davis, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,011
Int. Cl.³ E05B 55/10
U.S. Cl. 70—472 5 Claims



1. A flush-mountable door lock, comprising:

(a) a body structure having side and back walls which cooperate to define a forwardly-facing recess, and having an opening formed through the back wall;

(b) a bolt structure supported on the body structure at a location behind a portion of the back all, the bolt structure being movable between a latching and an unlatching position;

(c) a push button actuator mounted on the body structutre and being movable along a linear path of travel extending through the back wall opening between normal and operating positions;

(d) connecting means carried by the actuator for selectively drivingly connecting and disconnecting the actuator and bolt structures, the connecting means being movable between a connecting position wherein it is operable to provide a driving connection between the actuator and bolt structures such that, when the actuator structure is moved out of its normal position, the bolt structure is caused to move to its unlatching position, and a disconnecting position wherein no driving connection is provided between the actuator and bolt structures whereby, when the actuator structure is moved with respect to the body structure, no corresponding movement of the bolt structure is effected;

(e) key control means carried by the actuator and being operable to move the connecting means between its connecting and disconnecting positions;

(f) leaf spring means including an elongate leaf spring having a first portion secured to the body structure and having a second portion overlying the actuator for biasing the actuator toward its normal position, the body structure and the leaf spring having overlying portions defining a space therebetween; and,

(g) the connecting means being configured to extend between the overlying portions of the body structure and the leaf spring when the connecting means is in its disconnecting position.

4,312,204
PADDLE LOCK WITH TRANSLATABLY-MOUNTED HANDLE DISCONNECT MEMBER

Edwin W. Davis, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,015
Int. Cl.³ E05B 55/10
U.S. Cl. 70—472 28 Claims

1. A door lock, comprising:

(a) a body structure;

(b) a bolt structure connected to the body structure for movement between latching and unlatching positions, the bolt structure having a connecting formation connected thereto for movement along a first path of travel relative to the body structure in response to movement of the bolt structure between its latching and unlatching positions;

(c) a handle structure connected to the body structure for movement between normal and operating positions, the handle structure having an operating formation connected thereto for movement along a second path of travel relative to the body structure in response to movement of the handle structure between its normal and operating positions;

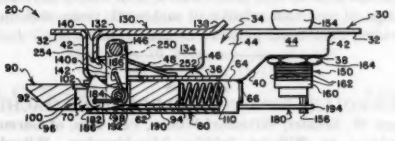
(d) key control means connected to a selected one of the structures and having a locking member which is movable relative to the selected structure between locked and unlocked positions, the key control means being operable to selectively retain the locking member in its locked and unlocked positions;

(e) disconnect means interposed between the operating formation and the connecting formation for selectively drivingly connecting and disconnecting the operating and connecting formations to thereby selectively drivingly connect and disconnect the handle and bolt structures, the disconnect means including:

(i) first and second parts;

(ii) first mounting means connecting the first part of the disconnect means to a given one of the structures for movement along a third path of travel relative to the given structure between connecting and disconnecting positions in response to movement of the locking member between its locked and unlocked positions;

(iii) second mounting means connecting the second part of



the disconnect means to a chosen one of the structures for movement, when the first part of the disconnect means is in its connecting position, along a fourth path of travel relative to the body structure in response to movement of the operating formation along the second path of travel;

(iv) the second part of the disconnect means including first and second pivotally connected components, the first component being pivotally connected to said chosen structure, the second component being pivotally connected to the first component; and,

(v) the first part of the disconnect means being operable to position the second component into and out of driving engagement with a selected one of the formations in response to positioning of the first part in its connecting and disconnecting positions; and

(f) the disconnect means being operable:

(i) when the first part of the disconnect means is in its connecting position, to drivingly connect the handle and bolt structures such that, when the handle structure is moved to its operating position, the bolt structure is caused to move to its unlatching position; and,

(ii) when the first part of the disconnect means is in its disconnecting position, to provide no driving connection between the handle and bolt structures, whereby the handle structure may be moved freely between its normal and operating positions without causing corresponding movement of the bolt structure.

4,312,205

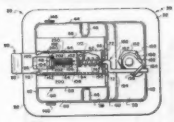
PADDLE LOCK WITH ROTATABLY-MOUNTED HANDLE DISCONNECT MEMBER

James A. Reed, Brecksville, and Edwin W. Davis, Medina, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,017

Int. Cl.³ E05B *55/10*

U.S. Cl. 70—472 **53 Claims**



1. A door lock, comprising:

(a) a body structure;

(b) a bolt structure connected to the body structure for movement between latching and unlatching positions, the bolt structure having a connecting formation connected thereto for movement along a first path of travel relative to the body structure in response to movement of the bolt structure between its latching and unlatching positions;

(c) a handle structure connected to the body structure for movement between normal and operating positions, the handle structure having an operating formation connected thereto for movement along a second path of travel relative to the body structure in response to movement of the handle structure between its normal and operating positions;

(d) key control means connected to a selected one of the structures and having a locking member which is movable relative to the selected structure between locked and unlocked positions, the key control means being operable to selectively retain the locking member in its locked and unlocked positions;

(e) disconnect means interposed between the operating formation and the connecting formation for selectively drivingly connecting and disconnecting the operating and connecting formations to thereby selectively drivingly connect and disconnect the handle and bolt structures, the disconnect means including mounting means connecting at least a part of the disconnect means to a given one of the structures for movement relative to the given structure:

(i) along a third path of travel relative to the given structure between connecting and disconnecting positions in response to movement of the locking member between its locked and unlocked positions; and,

(ii) when the part of the disconnect means is in its connecting position, along a fourth path of travel relative to the body structure in response to movement of the operating formation along the second path of travel;

(f) the disconnect means being operable:

(i) when the part of the disconnect means is in its connecting position, to drivingly connect the handle and bolt structures such that, when the handle structure is moved to its operating position, the bolt structure is caused to move to its unlatching position; and,

(ii) when the part of the disconnect means is in its disconnecting position, to provide no driving connection between the handle and bolt structures, whereby the handle structure may be moved freely between its normal and operating positions without causing corresponding movement of the bolt structure; and,

(g) the mounting means being operable to rotatably mount the part of the disconnect means for movement along the third path of travel relative to the given structure about a rotation axis, whereby the third path of travel is caused to take the form of an arc having the rotation axis as its center of radius.

4,312,206

MAKING A SEAMLESS, SPHERICAL CASE

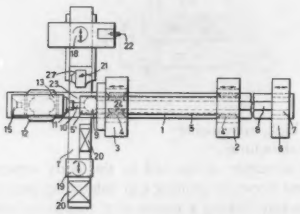
Clemens Halene, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,458

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851620

Int. Cl.³ B21B *27/06*

U.S. Cl. 72—69 6 Claims



1. A method of making a seamless case having a spherical contour, comprising the steps of providing a tubular blank;

heating one end portion of the blank;

working the one portion into a semisphere integral with a nipple and of a smaller diameter than said blank;

heating a portion of the blank adjacent to the semisphere; and

rolling and drawing the latter portion, or a portion thereof, as a partial continuation of the semisphere into a sphere, but continued further in a cylindrical portion having a reduced diameter as compared with the blank.

4,312,207

ROLLING MILL FOR FORMING CROSS RIBBED PIPES

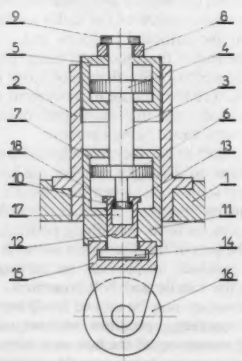
Janusz Przybyla, Zabkowice Bedzinskie; Leopold Haczek, Gliwice; Zygmunt Gozdziewicz; Andrzej Szal, both of Kedzierzyn-Kozle; Jozef Pieczyk, Walce, and Andrzej Maczynski, Kedzierzyn-Kozle, all of Poland, assignors to Zaklad Doswiadczalny Przy Zakladach Urzadzen Chemiczynch "Metalchem", Kedzierzyn-Kozle, Poland

Filed Dec. 6, 1979, Ser. No. 100,766

Claims priority, application Poland, Dec. 6, 1978, 211542

Int. Cl.³ B21B *31/32*

U.S. Cl. 72—100 2 Claims



1. A rolling mill for forming external ribs on an elongated cylindrical work piece such as a pipe, or the like, comprising a frame with three hydraulic actuator assemblies positioned at intervals of about 120 degrees from each other around the circumference of the elongated work piece and in a common plane which is transverse to the axis thereof, each actuator assembly having a rolling tool set to engage the work piece simultaneously with a corresponding tool in each of the other assemblies, each actuator assembly including a pair of coaxial pistons mounted on a common piston rod for movement toward and away from the work piece, a corresponding pair of coaxial cylinders for said pistons, the outer one of said cylinders being secured to the actuator frame, the inner one of said cylinders being slidably mounted in said frame, said inner cylinder having a bore through the inner end part thereof relative to the work piece, said bore being coaxial with said piston rod, a slider device in the form of an elongated cylinder of smaller relative dimension than the inner cylinder, said slider device being mounted for slidable movement in said bore relative to said inner cylinder, said slider device having at its inner end relative to the work piece an inwardly facing annular shoulder and an outwardly extending annular thrust flange, said piston rod having an extension coaxially extending into said slider device with an enlarged stop means on the inner end thereof engageable with said slider annular shoulder, said slider device including a thrust chamber located relatively inwardly of said shoulder and adapted to house said stop means of said piston rod, said slider device further including flange means at the inner end thereof engageable with a corresponding tool mounting yoke, said rolling tool of said actuator being mounted on said yoke adjacent the work piece, said piston rod extending through both of said cylinders and having at the remote outer end thereof a thrust flange secured against said outer cylinder fixed in said frame, and spacer means surrounding said piston rod and positioned between said outer thrust flange of said rod and said fixed outer cylinder, the numbers and dimensions of said spacer means determining the relative position of said tool relative to said work piece, and means providing fluid under pressure to said cylinders.

4,312,208

FOUR-ROLLER BENDING AND ROUNDING MACHINE

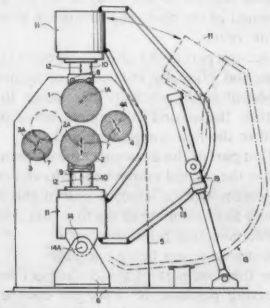
August W. Schäfer, Wilnsdorf-Wilden, Fed. Rep. of Germany, assignor to Wilhelm Schäfer Maschinenbau, Wilnsdorf-Wilden, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,623

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847965

Int. Cl.³ B21B *13/14, 15/00;* B21D *13/04*

U.S. Cl. 72—166 5 Claims



1. In a bending machine having

a pair of axially spaced end supports,

upper and lower axially extending bending rollers having ends journaled in said supports with said lower roller vertically limitedly displaceable in said supports and said upper roller vertically nondisplaceable in said supports, and

a pair of axially extending side rollers horizontally flanking

said upper and lower rollers and having ends journaled and vertically limitedly displaceable in said supports, the improvement comprising:

a C-shaped rigid member lying generally in a plane generally equidistant between said supports and perpendicular to the axes of said rollers and having rigid upper and lower arms respectively juxtaposed with said upper and lower bending rollers;

respective upper and lower support rollers vertically displaceably mounted on said upper and lower arms;

means including respective upper and lower hydraulic cylinders on said arms of said member for urging said upper and lower support rollers respectively downwardly and upwardly into engagement with said upper and lower bending rollers at said plane for preventing deflection of said bending rollers; and

means for pivotally displacing said member and said support rollers generally in said plane about a horizontal member axis below and generally parallel to the roller axes relative to said bending rollers and supports, whereby said member with said cylinders and support rollers can be pivoted out of the way for use of said machine in bending and rounding a tube.

4,312,209

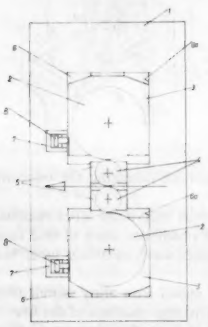
METHOD FOR OPERATING A STRIP ROLLING MILL

Manfred Hansen, Düsseldorf, Fed. Rep. of Germany, assignor to Sack GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,335

Int. Cl.³ B21B *31/32*

U.S. Cl. 72—237 **4 Claims**



1. A method for operating a rolling mill having at least one roll, said roll being supported in a chock, said chock being situated in a window having upright lateral sides, one of said sides being disposed in the direction of a transverse force component produced by a rolling force during the rolling operation, the method comprising:

moving said chock against said upright side of said window disposed in the direction of said transverse force component produced by said rolling force, by applying a lateral force to said chock prior to commencing said rolling force;

initiating a rolling operation thereby producing said rolling force; and

releasing said lateral force whereby said chock is maintained against said upright side due to said transverse force component.

4,312,210

WARM FORGING METHOD FOR CUP-SHAPED PIECES

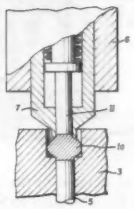
Masatoshi Nishizawa, Higashikurume; Toshihiro Minami, Kobe; Takeshi Nakahara, Akashi, and Toyofumi Hasegawa, Himeji, all of Japan, assignors to Kobe Steel Limited, Kobe and Nippon Koshuha Steel Co. Ltd., Tokyo, both of, Japan

Filed Mar. 14, 1980, Ser. No. 130,429

Claims priority, application Japan, Mar. 17, 1979, 54-31407; Apr. 3, 1979, 54-40655

Int. Cl.³ B21C *23/20, 23/32*

U.S. Cl. 72—267 **11 Claims**



1. A warm forging method for a cup-shaped piece, said method comprising:

heating a blank to between 400° and 800° C.;

inserting said blank having side walls and a first cross-sectional area into a forging die having side walls and a second cross-sectional area equal to that of the desired cup shaped piece, said first cross-sectional area being smaller than said second cross-sectional area by an amount sufficient that a gap exists between said side walls of said blank and said side walls of said die;

clamping both ends of said blank whereby said blank is centered in said die;

upsetting said blank in said die by an upsetting punch to a degree sufficient that said wall of said blank become bulged in shape by an amount no greater than that at which said walls of said blank barely contact said side walls of said die;

press fitting a backward extrusion punch on said bulged blank in said die; and

backwardly extruding said bulged blank in said die to form said cup shaped piece.

4,312,211

FORGING METHOD AND APPARATUS

Donald G. MacNitt, Jr., Singer Island, and Bryant H. Walker, Stuart, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 90,184, Nov. 1, 1979, Pat. No. 4,265,105. This application Nov. 28, 1980, Ser. No. 211,479

Int. Cl.³ B21K *1/32*

U.S. Cl. 72—354 **4 Claims**

1. A method for forging a component having a central disk region and a plurality of integrally formed appendages extending therefrom, comprising the steps of:

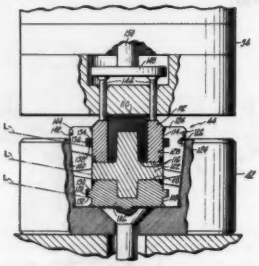
disposing a cylindrical array of adjacent die segments, having side walls contoured to the inverse geometry of the appendages to be formed, about a stationary end die;

placing a billet of material from which a workpiece is to be formed upon the stationary die within the cylindrical array;

placing a movable end die having a central element and a ring circumscribing the central element upon the billet within the cylindrical array;

raising the temperature of the billet and of the dies to the temperature at which the component is to be forged;

placing pressure pads against the ring circumscribing the central element of the movable die to prevent displacement of the ring by the billet as the central element is pressed against the billet;



pressing the central element of the movable die at the forging temperature into the billet to form a workpiece having an intermediate configuration;

maintaining the workpiece and die at the forging temperature; and

pressing the ring of the movable die at the forging temperature into the workpiece to form the workpiece into a final configuration.

4,312,212

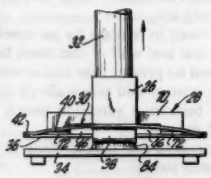
APPARATUS FOR TESTING THE TACK TIME OF EPOXY PREPREG

William H. Clendenin, Coshocton, Ohio, assignor to General Electric Company, Coshocton, Ohio

Filed Apr. 16, 1980, Ser. No. 140,736

Int. Cl.³ G01N *33/34*

U.S. Cl. 73—15.4 **11 Claims**



1. An assembly for testing the tack time of an epoxy prepreg glass cloth strip, said assembly comprising:

prepreg mounting means, including upper and lower opposed elongated support members, said support members being fixedly connected at their distal ends, with said prepreg strip being wrapped around said lower support member at a point intermediate the distal ends thereof, such that the thickness of said coiled prepreg strip causes said upper support member to be flexed upwardly in a bow-like configuration thereby defining a pair of open channels between said support members and disposed adjacent the opposed sides of said coiled prepreg strip;

a head member having a planar bottom surface, said head member further including a gripping means connected to said head member for holding said prepreg mounting means, said gripping means including a pair of spaced tine members disposed below and spaced from the plane of said bottom surface of said head member, said tine members being receivable in said open channels in said mounting means thereby gripping said mounting means;

a planar heated platen disposed below said head member; and

reciprocating means operatively associated with said head member for sequentially raising and lowering said head member such that said prepreg mounting means and coiled prepreg strip are brought into and out of abutting contact with said heated platen whereby during the operation of said apparatus, said prepreg strip is heated while pressed into contact with said platen by said head member thereby causing the epoxy therein to melt and wherein the repeated raising of said prepreg strip out of abutting contact with said heated platen by said reciprocating means enables any occurrence of the stringing of the epoxy, between said prepreg strip and said platen, to be observed, with the time elapsing between the initiation of said operation and the occurrence of said stringing corresponding to the tack time of the prepreg strip.

4,312,213

MEASURING CELL FOR DETECTING THE CONCENTRATION OF UF_6 IN H_2

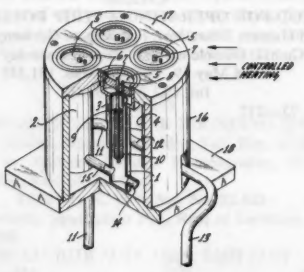
Peter Schlau, Frankfurt, Fed. Rep. of Germany, assignor to Hartman & Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,294

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849033

Int. Cl.³ G01N *27/04*

U.S. Cl. 73—27 R **3 Claims**



1. An apparatus for detecting the concentration of UF_6 in H_2, comprising:

a plurality of four individual tubes establishing respectively four tubular chambers, each of said tubes being made of corrosion-proof steel, said four tubes being arranged in a circle;

a plurality of nickel iron alloy annuli respectively welded peripherally to one end each of the four tubular chambers;

feed-through insulators based on an Al_2O_3 ceramic material, respectively brazed to said nickel iron alloy annuli;

a nickel layer on brazing material of the respective insulator-to-annulus connection;

a plurality of four heating conductors made of nickel and respectively contained in the chambers;

nickel or nickel-plated electrodes for connection to the conductors and being fed through said ceramic material insulators;

a plurality of mandrels, there being one of said mandrels in each of the chambers for respectively supporting the conductors in a coiled configuration, the mandrels of the plurality being respectively centrally disposed in the tubular chambers, one of the electrodes supporting the mandrel and being centrally fed through the respective insulator;

means for mounting said tubular chambers in the circular arrangement;

means for feeding measuring gas to two of the chambers, the others containing a reference gas; and

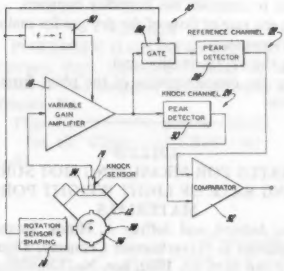
circuit means including a measuring instrument for interconnecting the four heating conductors.

4,312,214

KNOCK DETECTOR FOR INTERNAL COMBUSTION ENGINE

Dennis M. Kramer, Rochester, and John C. Dock, Warren, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 17, 1980, Ser. No. 160,268
Int. Cl.³ G01M *23/22*
U.S. Cl. 73—35 **6 Claims**



1. In a spark-ignited internal combustion engine, means detecting the occurrence of engine knock in the presence of background engine noise comprising:

means sensing mechanical engine vibrations and generating an oscillatory electrical signal whose amplitude and frequency components correspond to the vibrations within a frequency band which contains knock-induced vibrations if engine knock occurs;

means amplifying said oscillatory electrical signal by a larger amplification factor at lower engine speeds than at higher engine speeds;

a knock channel circuit comprising means peak-detecting the amplified version of said oscillatory electrical signal to develop a knock channel signal;

a reference channel circuit comprising detection means and gating means operable during selected intervals coincident with the absence of any appreciable engine knock to gate the amplified version of said oscillatory electrical signal to said detection means, said detection means comprising means developing from the thusly gated amplified version of said oscillatory electrical signal a reference channel signal;

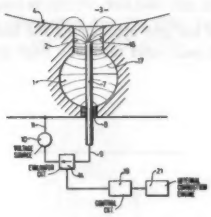
and means receiving said knock and reference channel signals and comparing one to the other to provide a knock detection signal in accordance with a predetermined relationship between the two indicative of engine knock.

4,312,215

APPARATUS FOR DETECTING PRESSURE FLUCTUATIONS IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Klaus Dobler, Gerlingen; Christian Zrenner, Stuttgart; Günter Schirmer, Ingersheim, and Alfred Kizler, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 2,478, Jan. 10, 1979, Pat. No. 4,232,545.
This application Jul. 11, 1980, Ser. No. 187,584
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802202
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **5 Claims**



1. In an apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine, comprising:

an ionic current sensor mounted to the engine for exposure to the gas in a combustion chamber, said ionic current sensor including: means defining a dead space and a connecting channel which extends between the dead space and the combustion chamber; a first electrode; and a second electrode spaced from the first electrode, between which electrodes a measurement voltage is applied, wherein said connecting channel also defines the spacing between the first and second electrodes,

wherein the first and second electrodes are formed and associated with each other in such a way that the lines of force extending between both electrodes are substantially limited to the connecting channel, and

wherein the first electrode is rod-like and is disposed coaxially to the axis of the connecting channel, and wherein the second electrode is formed by means of a wall by the means defining the connecting channel, and

wherein the ionic current sensor further includes a third electrode, wherein the first electrode is surrounded by the third electrode for a portion of the total length of the first electrode in the vicinity of the connecting channel, and wherein the same polarity of the measurement voltage is applied to the first and the third electrodes.

4,312,216

DEVICE FOR VIBRATING THE PIN OF A VISCOMETER

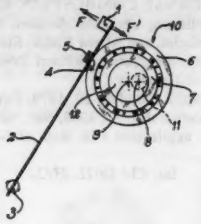
Paul Beaudoin, Vimory; Patrick Gilbert, Montargis, and Jacques Petres, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1980, Ser. No. 161,737
Claims priority, application France, Jul. 24, 1979, 79 19051
Int. Cl.³ G01N *11/16*
U.S. Cl. 73—54 **1 Claim**

1. In a vibrating viscometer of the type comprising a U-shaped pin composed of two arms, namely an emitter arm and a receiver arm,

a device for vibrating the pin, wherein the emitter arm thereof is fixed to the end of a spring leaf pivoted about a fixed point, said leaf abutting on a ball bearing whose inner race is moved in rotation by a drive shaft eccentric with

respect to the axis of the bearing and whose outer race is locked in rotation under the effect of a powerful magnet



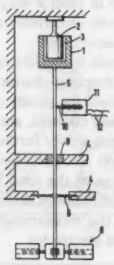
fixed on said leaf and maintaining the latter in permanent contact with said outer race, at a fixed point thereof.

4,312,217

APPARATUS AND METHOD FOR MEASURING CHANGES IN CONDITIONS IN COAGULATING LIQUIDS

Hellmut Hartert, Kaiserslautern, Fed. Rep. of Germany, assignor to Dr. E. Fresenius Chem.-pharm Industrie KG, Oberursel, Fed. Rep. of Germany

Continuation of Ser. No. 941,587, Sep. 12, 1978, Pat. No. 4,202,204. This application Mar. 21, 1980, Ser. No. 133,649
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741060
Int. Cl.³ G01N *11/10, 33/48*
U.S. Cl. 73—64.1 **18 Claims**



1. A method for measuring the changes of state in solidifying fluids particularly the changes occurring in the coagulation of blood, comprising the steps of:

mounting a measuring vessel on a support in a measuring system,

introducing a fluid into the measuring vessel,

impressing a constant excitation frequency on the support to stimulate the support into a forced oscillatory movement at a frequency at least near the natural frequency of the measuring system, and

measuring the amplitude of the support for determining the change in state of the solidifying fluid,

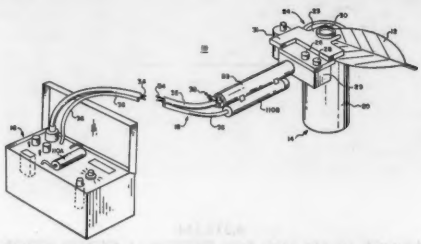
said constant excitation frequency corresponding at at least one time during the measuring to the changing resonant frequency of the measuring system.

4,312,218

POROMETER AND METHOD FOR STOMATAL MEASUREMENTS

Robert D. Eckles, Lincoln, Nebr., assignor to Li-Cor, Inc., Lincoln, Nebr.

Filed Sep. 4, 1979, Ser. No. 71,847
Int. Cl.³ G01N *33/00, 33/48*
U.S. Cl. 73—76 **46 Claims**



1. A method of determining characteristics of a plant related to its ability to create humidity in its vicinity comprising the steps of:

measuring the humidity created by the plant in a location;

forcing dry gas through said location;

automatically changing the rate of flow of said dry gas in response to changes in the measured humidity created by the plant to maintain the humidity constant;

measuring the rate of flow of the dry gas for maintaining the humidity constant;

measuring the vapor density; and

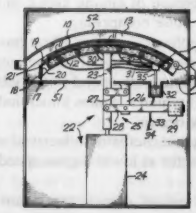
calculating the characteristics of the plant from said measurements.

4,312,219

APPARATUS FOR MEASURING HOT SURFACE DRYING RATE OF LIGHT WEIGHT POROUS MATERIALS

Peter F. Lee, Auburn, and Jeffrey A. Hinds, Sumner, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 10, 1980, Ser. No. 128,600
Int. Cl.³ G01N *5/04*
U.S. Cl. 73—76 **7 Claims**



1. An apparatus for continuously measuring the weight of a porous material during drying on a hot surface, comprising:

a plate, having a heat transfer surface in contact with said porous material, said plate having a heating means for maintaining said heat transfer surface at a constant uniform temperature;

a permeable fabric means for adhering said porous material into heat transfer contact with said plate, without substantially impeding mass transfer from said porous material;

an air delivery means for directing a flow of air, of constant temperature and humidity, uniformly over the surface of said fabric means; and

a load sensor means, for weighing continuously changes in weight of said material while said material is being dried on said plate, wherein said sensor means supports said plate, material and fabric means independently of forces not related to the weight loss of said material.

7. A method of characterizing porous cellulosic sheets having a basis weight greater than at least about 50 g/m^2, comprising:

adhering a sample of said cellulosic sheet to a hot plate means having;

a heat transfer surface and a means for imparting a uniform constant temperature thereto,

a permeable fabric means for adhering said porous material into heat transfer contact with said plate without substantially impeding mass transfer from said porous material,

an air delivery means for directing a flow of air of constant temperature and humidity uniformly over the surface of said fabric means, and

a load sensor means for weighing continuously changes in weight of said material while said material is heated by said plate, wherein said sensor means supports said hot plate material and fabric means independently of forces not related to the weight loss of said material;

heating said sample on said hot plate means until said sample is bone dry; and

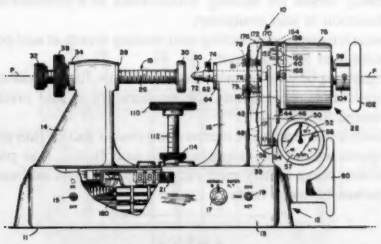
recording, simultaneously with said heating step, the weight of said sample as it dries

wherein the rate of change of said weight with time correlates with drying rate performance of said sample in a paper machine cylinder drying machine.

4,312,220
PORTABLE HARDNESS TESTER

Roland Borgersen, Bryn Mawr, and James G. Mullen, Bala Cynwyd, both of Pa., assignors to King Tester Corporation, King of Prussia, Pa.

Filed Oct. 17, 1979, Ser. No. 85,631
Int. Cl.^{3} G01D *5/34;* G01N *3/42*
U.S. Cl. 73—81 **16 Claims**



1. A hardness tester comprising:

a. a frame, including means for holding a hardness test specimen;

b. a penetrator slidably mounted in an assembly on said frame for linear movement along an axis, for indenting said specimen;

c. loading means for applying a predetermined load to said penetrator in a direction parallel said axis, when said penetrator has contacted said specimen;

d. rotatable means for actuating said loading means, angular displacement of a rotatable portion of said actuating means from a reference position defined by said penetrator contacting said specimen before said predetermined load is applied to said penetrator having a predetermined correlation with linear penetration of said specimen by said penetrator moving along the penetration axis when said predetermined load is applied to said penetrator;

e. electro-optical mechanical encoding means connected to said actuating means for producing electrical coded signals proportional to angular displacement of said rotatable portion of said actuating means;

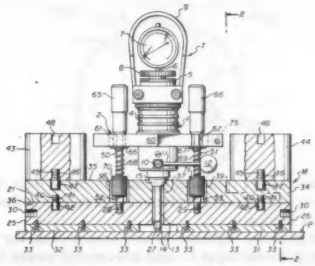
f. receiving means for converting said output electrical signal to an intermediate electrical signal corresponding to the hardness number of the specimen; and

g. optical display means for receiving said intermediate signal and for visually displaying the specimen hardness number.

4,312,221
HARDNESS TESTER MOUNTING APPARATUS

John C. Edward, 780 Callaway, Beaumont, Tex. 77706, and Robert M. Edward, Jr., 18 Kittiwake Ct., The Woodlands, Tex. 77380

Continuation-in-part of Ser. No. 944,548, Sep. 21, 1978, Pat. No. 4,199,976. This application Apr. 28, 1980, Ser. No. 144,530
Int. Cl.^{3} G01N *3/40*
U.S. Cl. 73—81 **9 Claims**



1. Mounting apparatus for use with a hardness tester of the type having a housing in which is carried a reciprocating penetrator for measuring hardness properties of materials to be tested, said mounting apparatus comprising:

an elongated base member having parallel upper and lower flat surfaces, the edges of which are joined by first and second side surfaces and the ends of which are joined by first and second end surfaces, a hole being provided through said base member substantially midway between said first and second end surfaces and the axis of which is substantially perpendicular to said upper and lower surface;

substantially parallel elongated shoe members attached to said base member adjacent said lower surface and near the edges thereof for contact with said material to be tested; and

means for removably attaching said hardness tester housing to said base member so that said penetrator is disposed in said base member hole for reciprocal movement therein and for engagement with said material to be tested.

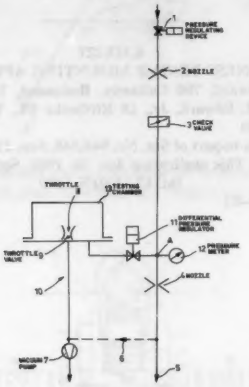
4,312,222
APPARATUS FOR TESTING THE VOLUME OF FLUID MEDIUM FLOWING THROUGH VARIABLE CROSS-SECTION THROTTLE

Ernst Leunig, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,459
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926787
Int. Cl.^{3} G01F *9/00*
U.S. Cl. 73—118 **3 Claims**

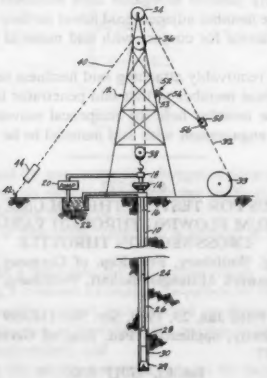
1. An apparatus for measuring the volume of a fluid medium flowing through a variable cross-section device having an inlet and an outlet under test, comprising;

(a) a primary fluid duct having an inlet;
(b) a first constant cross-section nozzle at said duct inlet providing a constant rate of flow of said medium therethrough;
(c) a second constant-cross section nozzle in said primary duct downstream from said nozzle maintaining a constant pressure of said medium at the outlet of said device under test;



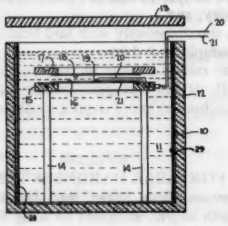
(d) a branch duct intersecting said primary duct between said first and second nozzles and connected to the inlet of said test device;
(e) a fluid pressure regulator in said branch duct, for regulating the pressure input to said device and means for measuring fluid pressure at said intersection of said primary duct and said branch duct;
whereby the volume of said medium flowing through said device under test can be determined from said measured fluid pressure.

4,312,223
CARRIER SYSTEM FOR POSITIONING SENSORS ADJACENT A WIRE ROPE
Christopher E. Koch, Sacramento, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.
Filed Jul. 11, 1980, Ser. No. 167,785
Int. Cl.³ E21B *47/04*
U.S. Cl. 73—151 **12 Claims**



9. In a well rig having equipment that is moved upwardly or downwardly by spiral wound wire rope that is supported by a derrick and moved by a drawworks having a rotatable drum, apparatus for positioning proximity sensors for determining the depth in a well of equipment supported by the wire rope comprising:
(a) a housing for positioning the proximity sensors adjacent the wire rope having spring-loaded roller means at two spaced locations for engaging the wire rope at said spaced locations along the direction of movement of the wire rope, with the sensors being affixed to the housing at a position between said two spaced locations for the roller means to sense the spiral windings of the wire rope, and
(b) a pivoted suspension system for supporting said housing extending between a selected location on the derrick and the housing for supporting the housing so that the housing can follow any lateral movement of the wire rope.

4,312,224
ABSORBED DOSE WATER CALORIMETER
Steve R. Domen, Derwood, Md., assignor to United States of America, Washington, D.C.
Filed Feb. 29, 1980, Ser. No. 126,108
Int. Cl.³ G01K *17/00*; G01T *1/16*
U.S. Cl. 73—190 EW **17 Claims**



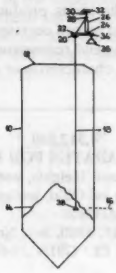
1. A calorimeter-radiation dosimeter for measuring an absorbed dose profile comprising:
a container for a liquid;
sensing means for sensing temperature at a predetermined location in said container;
insulative means supporting said sensing means at said predetermined location; and
means responsive to said sensing means for providing an indication representing the temperature at said predetermined location;
wherein said insulative means comprises a pair of thin plastic sheets which are impervious to said liquid, said pair of sheets being tightly sandwiched together with said sensing means between them.

4,312,225
DEVICES FOR DETECTING LEVELS
David M. Williams, 16 Sedop Close, Saffron Walden, Essex, England
Filed Feb. 25, 1980, Ser. No. 124,225
Claims priority, application United Kingdom, Mar. 3, 1979, 07552/79
Int. Cl.³ G01F *23/10*
U.S. Cl. 73—308 **2 Claims**

1. A device for detecting the level of the material within a container comprising
an elongated cord suspended within the container from a fixed point thereabove, the length of the cord being selected so that it reaches to just below the level in the container in which the presence (or absence) of material within the container is to be detected;
electrical switch means which is sensitive to changes in inclination thereof and is contained within a housing and is operable to respond to changes in tension in the cord brought about either as the lower end of the cord is ini-

tially buried by a rising level of the material within the container or as the lower end of the cord becomes exposed as the level of the material in the container drops;

a rigid bar fixed to the lower end of the housing of the electrical switch, the junction between the lower end of the switch housing and the bar being located at a point intermediate the two ends of the bar;



an aperture in one end of the bar through which the cord passes; means provided at the other end of the bar to allow the initial condition of the bar to be set up and the weight component of the hanging cord compensated by the addition of weights until the switch just hangs vertically;

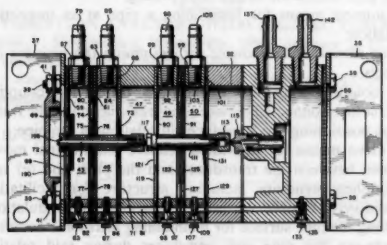
the junction between the switch housing and the bar being located further from the end through which the cord passes than the other end of the bar.

4,312,226

COMPARATOR

Harold P. Adams, Norridge; Wesley L. Taylor, Glenview, both of Ill., and James B. Blanchard, Green Bay, Wis., assignors to Mark Controls Corporation, Evanston, Ill.

Filed Nov. 30, 1979, Ser. No. 98,866
Int. Cl.³ G01K *3/08;* G01L *13/02*
U.S. Cl. 73—336 **8 Claims**



1. A comparator for indicating which of two air sources is more efficient to condition to a predetermined temperature, said comparator comprising:

first means for comparing a first input signal indicative of the relative humidity of air from a first source and a second input signal indicative of the relative humidity of air from a second source and for generating in response thereto a first force indicative of the difference between said first input signal and said second input signal;

second means for comparing a third input signal indicative of the dry-bulb temperature of air from the first source and a fourth input signal indicative of the dry-bulb temperature of air from the second source and for generating a second force indicative of the difference between said third input signal and said fourth input signal;

means for adding said first force and said second force to produce a combined force indicating which of said first and said second source has higher enthalpy whenever the humidity of air from said first source is higher than that of air from said second source and for disengaging said first comparing and generating means from said second comparing and generating means whenever the humidity of air from said first source is lower than that of air from said second source; and

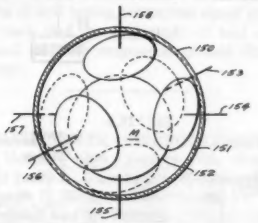
output means for receiving said combined force or said second force and for producing in response thereto an output signal indicating which of said first and said second air sources is more efficient to condition.

4,312,227

FORCE-RESPONSIVE DEVICE

Karlis V. Ozols, 44 Thorne Ave., Mt. Kisco, N.Y. 10549

Division of Ser. No. 790,045, Apr. 22, 1977, Pat. No. 4,138,600. This application Dec. 1, 1978, Ser. No. 965,784
Int. Cl.³ G01P *15/125*
U.S. Cl. 73—516 LM **12 Claims**



1. A force-responsive monitoring device, comprising

a hollow closed shell having a circumferential wall;

a body of material subject to cohesion under the influence of surface tension accomodated with clearance in said shell for free floating movement therein and relative to said shell in response to changes in a force acting upon said shell and body; said body assuming a spherical shape in zero gravity and being capable of assuming a non-spherical shape in the presence of gravity; and

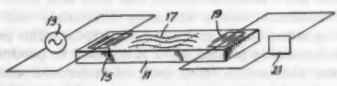
means for monitoring the position of said body relative to said shell without physical contact with said body and for thereby indicating said changes in the force as a function of the monitored position, said means including capacitance plates located at portions of said wall and which sense the approach and receding of said body from said portions.

4,312,228

METHODS OF DETECTION WITH SURFACE ACOUSTIC WAVE AND APPARATI THEREFOR

Henry Wohltjen, 181 E. Lake Blvd., Mahopac, N.Y. 10451

Filed Jul. 30, 1979, Ser. No. 62,019
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 **16 Claims**



1. A method detecting information relating to a polymer which comprises generating in a piezoelectric material element a surface acoustic wave; during the traveling of the surface acoustic wave through the piezoelectric material element, contacting a thin layer of the polymer with the surface through which the wave travels; subjecting the thin layer to a variation in environment during said contact thereby modifying a property of the polymer and changing either or both of the velocity

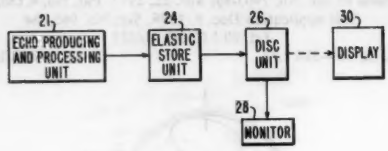
of sound in, and a dielectric property of, the polymer so as to alter one or more of the frequency, amplitude and phase of the surface acoustic wave; and measuring said alteration as an indication of the modification of the polymer property during the variation in environment.

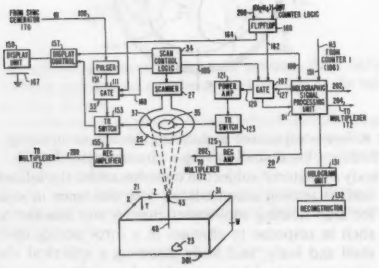
4,312,229

DETECTION, CHARACTERIZATION, AND STUDY OF FLAWS IN WORK WITH ACOUSTIC ENERGY

Michael J. Hurwitz, Pittsburgh, Pa.; Paul G. Kennedy, Linthicum Heights, Md., and James W. H. Justice, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1979, Ser. No. 32,841
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—603 **15 Claims**





11. The method of detecting, characterizing and studying flaws in work with apparatus including focused-arc acoustic energy transducer means, an echo-ranging subassembly connected to said transfer means, when actuated, to energize said transducer means and to process echo trains resulting from the acoustic energy from said transducer means impinging on said work and received by said transducer means, point-focusing transducer means, a holographic echo processing subassembly connected to said point-focusing transducer means, when actuated, to energize said point-focusing transducer means and to process echoes resulting from the acoustic energy from said point-focusing transducer means impinging on said work and received by said point-focusing transducer means, and an elastic store;

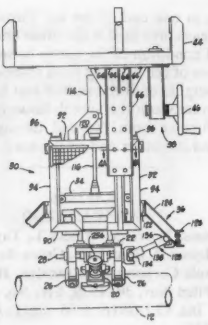
the said method comprising scanning said work with said focused-arc transducer means and with said point-focusing transducer means, actuating alternately said echo-ranging subassembly and said holographic echo processing subassembly as said work is scanned to produce and process alternately, from each of successive elemental areas of said work, echo trains produced by said focused-arc transducer means and said echo-ranging subassembly and echoes produced by said point-focusing transducer means and said holographic echo-processing subassembly, storing in said elastic store a set of magnitudes for each of said elemental areas, each set including magnitudes of successive echo components of each of said echo trains and magnitudes of each of said echoes from the echo components of each said set being derived from reflections from successive depths of said work and said echoes being derived from reflections at predetermined depths of said work under each of said elemental areas, producing from the said sets of magnitudes received from the echo trains and succeeding echoes resulting from the acoustic energy impinging on a plurality of elemental areas and stored in said elastic store, a video record of said sets of magnitudes, producing a display on a cathode-ray tube of the portion of the content of said video record corresponding to said echo trains, producing a hologram of the content of said video record corresponding to said echoes, viewing said display, and reconstructing and viewing said hologram to detect, characterize or study the flaws, if any, in said work.

4,312,230

METHOD AND APPARATUS FOR PIPE INSPECTION

John K. Bricker, Cleveland Heights, and Joseph M. Mandula, Jr., Seven Hills, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 15, 1980, Ser. No. 121,814
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—638 **29 Claims**



1. A pipe inspection system comprising:

(a) support means for positioning a pipe at an inspection station;

(b) an ultrasonic transducer for examining the pipe for defects;

(c) mounting apparatus including a frame and coupling structure connected between the transducer and the frame for positioning the transducer in relation to the pipe;

(d) drive means for providing relative longitudinal movement between the transducer and the pipe; and (e) said coupling structure including structure for facilitating relatively flexible transducer tracking of undulations along the pipe surface for maintaining ultrasonic coupling between the pipe and transducer during said relative movement along the length of the pipe while substantially preventing movement of the transducer about the pipe circumference.

4,312,231

APPARATUS FOR GENERATING AND DETECTING AN ELECTROMAGNETIC ULTRASONIC WAVE

Katsuhiro Kawashima; Shoji Murota, both of Kitakyushu; Yukio Nakamori, Nakama, and Hisao Suzuki, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 6, 1979, Ser. No. 55,298
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—643 **14 Claims**

1. An apparatus for generating and detecting an electromagnetic ultrasonic wave, comprising:

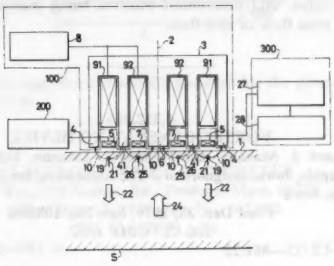
a magnetic field generator for generating a magnetic field

applied to a surface are of one side of a conductive material;

a high frequency pulse source for generating a high frequency current pulse;

an ultrasonic wave generating coil for receiving said current pulse from said high frequency pulse source to produce a first eddy current and a magnetic field pulse in the surface area of said conductive material and for generating an ultrasonic wave in the conductive material, which ultrasonic wave generates resulting from interaction between said first eddy current and the magnetic field pulse;

a detecting coil for detecting a second eddy current which



generates in the surface area of the conductive material as a result of interaction between the magnetic field formed by the magnetic field generator and an ultrasonic wave reflected by another side of the conductive material or an internal defect contained in the conductive material;

a displaying apparatus for displaying a detecting signal detected by the detecting coil;

said detecting coil being positioned peripherally around a central magnetic pole of said magnetic field generator, and decoupling means peripherally positioned around the outer perimeter of said detecting coil and said ultrasonic wave generating coil being positioned peripherally around the outer perimeter of said decoupling means.

4,312,232

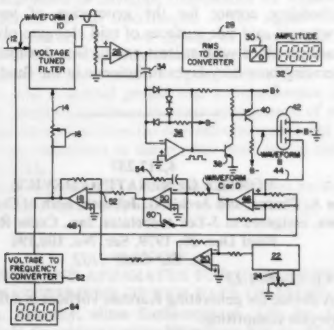
VIBRATION ANALYZER WITH DIGITAL READOUT

Donn V. Stoutenburg, Westerville, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 76,029, Sep. 17, 1979, abandoned. This application Jul. 30, 1980, Ser. No. 173,808

Int. Cl.³ G01H *3/12*; H03H *7/12*

U.S. Cl. 73—659 **15 Claims**



1. A system for carrying out the vibrational analysis of apparatus having a dynamic characteristic comprising:

input means for receiving an a.c. input signal corresponding with said dynamic characteristic;

a voltage-tunable filter of a variety wherein the passband center frequency thereof is selectible as an exponential function of a tuning input voltage applied at a tuning input thereof, said filter receiving said a.c. input and providing a filtered signal at an output;

amplitude readout means coupled with said filter output for providing a visible indication of the instantaneous amplitude of said filtered signal;

manually actuable voltage source means for providing a manually selectable primary tuning input voltage assertable at said filter tuning input;

detector means for comparing the phase of said input signal with the phase of said filtered signal to derive an error signal corresponding with a phase difference therebetween;

integrator means for treating said error signal to provide a tuning correction signal;

summing means coupled with said filter tuning input and said integrator means for summing said tuning correction signal and said primary tuning input voltage; and

manually actuable switch means for selectively effecting the assertion of said tuning correction signal at said summing means such that the magnitude of said error signal is minimized and the magnitude of said filtered signal is maximized.

4,312,233

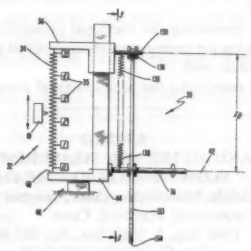
FLOW RATE METER CORRECTION APPARATUS

Stephen D. Reimers, 6269 Leesburg Pike, Falls Church, Va. 22044, and Larry L. Wischhoefer, Washington, D.C., assignors to Stephen D. Reimers, Falls Church, Va.

Filed Jan. 31, 1980, Ser. No. 117,209

Int. Cl.³ G01F *15/02*

U.S. Cl. 73—861.01 **9 Claims**



1. Apparatus for correcting to read actual flow the indication on a flow rate meter used in a fluid supply system having actual measurement conditions and/or point of fluid use conditions varying substantially from meter calibration conditions, the flow rate meter having an indicator, the indicated flow rate being uniquely related to the movement of the indicator from a zero flow rate reference mark, the apparatus comprising:

(a) adjustable scale means for indicating corrected flow rate;

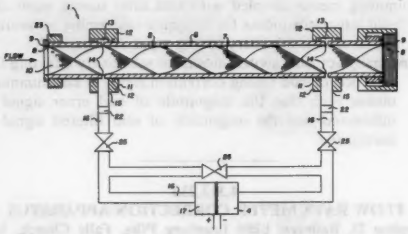
(b) means for calculating a correction factor relating the meter indicator deflection at actual measurement and point-of-use conditions to the meter indicator deflection at calibration conditions, said calculating means being responsive to inputted values of a plurality of flow rate indication influencing variable parameters representative of the actual measurement and point-of-use conditions;

(c) positioning means responsive to said calculating means for interrelating said adjustable scale means with the meter indicator, a corrected flow rate being indicated on said adjustable scale means by the meter indicator,

wherein said adjustable scale means includes a variable length scale means having a continuously stretchable member, wherein the effective length of said stretchable member is controllable relative to the effective travel range of the meter indicator and wherein said interrelating

means includes positioning means cooperating with said variable length scale means for converting said calculated correction factor into a proportional change in the effective length of said stretchable member relative to the effective travel range of the meter indicator.

4,312,234
TWO-PHASE FLOWMETER
E. Rhodes, and D. S. Scott, both of Waterloo, Canada, assignors to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada
Filed May 12, 1980, Ser. No. 149,249
Int. Cl.³ G01F 1/74
U.S. Cl. 73—861.04 **12 Claims**



1. A flowmeter for measuring differential pressures indicative of flowrates in a conduit carrying a gas and liquid flowing stream, comprising:

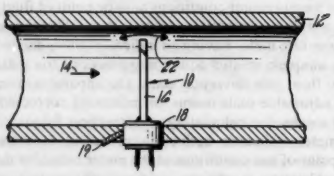
first means for creating a frictional pressure drop in the conduit;

means for measuring the frictional pressure drop;

second means for creating an accelerational pressure drop in the conduit; and

means for measuring the accelerational pressure drop.

4,312,235
SENSOR AND METER FOR MEASURING THE MASS FLOW OF A FLUID STREAM
Louis J. L. Daigle, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Sep. 2, 1980, Ser. No. 183,486
Int. Cl.³ G01F 1/28, 1/78
U.S. Cl. 73—861.18 **22 Claims**

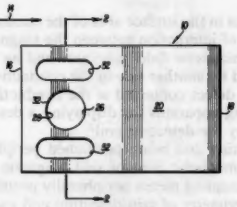


1. A mass flowmeter for measuring the mass flow of a fluid stream in a duct, comprising:

sensor means having a base and oscillatory means supported by and adapted for oscillatory motion relative to said base, said base being adapted to be fixedly positioned relative to said duct such that at least part of said oscillatory means extends into the duct for flow-damped oscillation in the fluid stream therewithin, said oscillatory means including drive transducer means responsive to an electrical input signal for stimulating oscillatory motion thereof and pickup transducer means for providing an electrical output signal indicative of the flow-damped oscillations thereof; and

electronic circuit means being operatively connected to said drive transducer means for applying an electrical input signal thereto to stimulate said oscillatory means to a peak amplitude of oscillation and for removing said input signal and being operatively connected to said pickup means for subsequently determining the interval required for the amplitude of said oscillations to decay from a predetermined upper threshold value no greater than said peak oscillation amplitude to a predetermined lower threshold value, said determined interval being indicative of the mass flow of said fluid.

4,312,236
VORTEX GENERATING DEVICE
Richard J. Mahany, and Archie G. Johnson, both of Cedar Rapids, Iowa, assignors to J-Tec Associates, Inc., Cedar Rapids, Iowa
Filed Dec. 28, 1979, Ser. No. 108,066
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.22 **5 Claims**



1. A device for generating Karman vortices in a fluid stream, said device comprising:

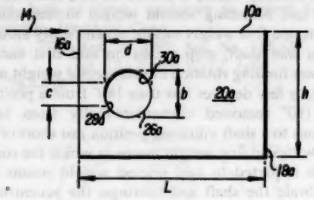
a narrow elongate plate member having an axis of elongation parallel to the direction of flow of said fluid stream, said elongate plate member having side surfaces essentially parallel to said direction flow, said elongate plate member also having at least one aperture, wherein said aperture intersects at least one said side surface to form at said side surface a leading aperture edge with respect to said direction of flow such that said leading aperture edge forms a shedding corner for the generation of vortices; and wherein said side surfaces of said elongate plate member are provided with at least one surface disruption for generating boundary-layer turbulence in the fluid stream.

4,312,237
VORTEX GENERATING DEVICE
Glenn A. Thorne, and Archie G. Johnson, both of Cedar Rapids, Iowa, assignors to J-Tec Associates, Inc., Cedar Rapids, Iowa
Filed Dec. 28, 1979, Ser. No. 108,196
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.22 **36 Claims**

1. A device for generating Karman vortices in a fluid stream, said device comprising:

a narrow, elongate plate member having an axis of elongation parallel to the direction of flow of said fluid stream, said elongate plate member having side surfaces essentially parallel to said direction of flow, said elongate plate member also having at least one aperture, and wherein said aperture intersects at least one said side surface to

form at said side surface a leading aperture edge with respect to said direction of flow such that said leading aperture edge forms a shedding corner for the generation of vortices.

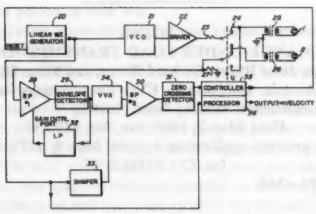


4,312,238

ELECTRO-ACOUSTIC FLOWMETER

Thomas J. Rey, 319 Nashua Rd., Bedford, Mass. 01730

Filed Dec. 13, 1979, Ser. No. 103,100
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.28 **15 Claims**



1. A system for measuring the velocity of fluid flow in a conduit comprising

first and second transducers spaced apart upstream and downstream of the fluid flow,

means for establishing an excitation signal of frequency that linearly varies with time,

means coupling the excitation signal to the transducers,

means coupled from the transducers for amplifying and detecting the received excitation signal including envelope detector means,

means responsive to envelope fluctuations for measuring a first period due to interference in the signal received downstream between two groups of sounds, that have travelled from the upstream transducer to the downstream transducer in the conduit wall and in the fluid, respectively, and a second period due to interference in the signal received upstream between two groups of sounds that have travelled from the downstream transducer to the upstream transducer in the conduit wall and in the fluid respectively,

and means responsive to a difference in the two periods for providing a signal proportional to fluid velocity.

4,312,239

METHOD AND APPARATUS FOR ULTRASONIC MEASUREMENT OF THE RATE OF FLOW

Eduard A. Zalessky, ulitsa Tashkentskaya, 130, kv. 11, and Vladimir V. Smyshlyaev, ulitsa Michurina, 116, kv. 57, both of Kuibyshev, U.S.S.R.

Filed Aug. 20, 1979, Ser. No. 68,472
Int. Cl.³ G01F *1/66*; G01P *5/00*
U.S. Cl. 73—861.29 **3 Claims**

1. A method of ultrasonic measurement of a rate of flow of a medium under control, said method utilizing a single acoustic channel and a self-excited oscillator having a selected frequency, said method comprising the steps of

simultaneously passing first and second auto-circulation pulse trains in opposite directions through the medium under control and through a single acoustic channel;

phase synchronizing the self-excited oscillator via the pulses of said first pulse train, the frequency of said oscillator being a whole number of times the repetition rate of said first pulse train;

interrupting said first pulse train before an instant at which the pulses of said first and second pulse trains coincide;

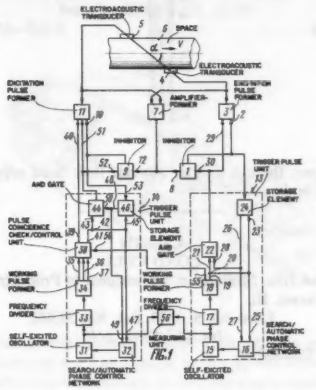


Fig. 1

holding a pulse from said oscillator out of coincidence with a pulse of said second pulse train in order to eliminate the instants of coincidence;

restoring said first pulse train via said pulse from said oscillator;

comparing the repetition rate of the pulses of said second pulse train with the frequency of said oscillator in order to determine the difference between the repetition rates of the pulses of said pulse trains; and

determining the rate of flow of said medium by utilizing the difference between the repetition rates of the pulses of said pulse trains.

4,312,240

CORROSION-RESISTANT VARIABLE AREA FLOWMETER

Henry M. Hermanns, Rydal, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

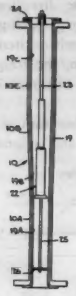
Filed Jun. 2, 1980, Ser. No. 155,169
Int. Cl.³ G01F *1/22*
U.S. Cl. 73—861.57 **10 Claims**

1. A variable-area flowmeter for measuring corrosive fluids, said flowmeter comprising:

A. a metal metering tube having a straight line cylindrical inlet section joined to a tapered intermediate section whose input has the same internal diameter as that of the inlet section and whose relatively large diameter output is joined to a straight line cylindrical section having the same internal diameter, the fluid to be metered being admitted into the inlet section to flow upwardly through the tube for discharge from the outlet section, said tube being internally lined with PTFE material which intimately conforms to the inner surface of the sections thereof; and

B. a float assembly operating in said tube and axially shiftable thereon as a function of flow rate, said assembly including a cylindrical body formed of FEP material, said body having an upper section housing a permanent mag-

net and a lower section completing said housing and thermally welded to the upper section to hermetically seal said

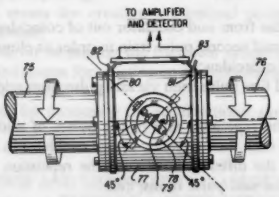


magnet therein, and an annular float head supported by said body.

4,312,241
LOAD CELL

Tadas Budraitis, Midlothian, Ill., assignor to Productronix, Inc., Oak Forest, Ill.

Filed Jul. 5, 1979, Ser. No. 54,662
Int. Cl.³ G01L *3/10*
U.S. Cl. 73—862.35 **4 Claims**



1. A load cell to be coupled between two shafts for measuring the torque transmitted between said two shafts, comprising:

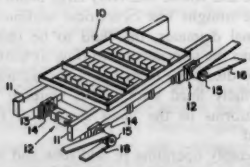
a hollow cylindrical carrier having ends for connection with said shafts, the material of said carrier having a shear angle; and

means for measuring deformation of said cylindrical carrier along a plane at the shear angle of the carrier material indicative of the torque transmitted between said shafts.

4,312,242
MECHANICAL VIBRATOR ASSEMBLY

William F. Wallis, Atlanta, Mich., assignor to Besser Company, Alpena, Mich.

Filed Feb. 11, 1980, Ser. No. 120,638
Int. Cl.³ B06B *1/16*; B65G *27/20*
U.S. Cl. 74—87 **4 Claims**

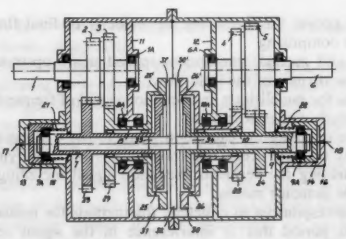


1. A mechanical vibrator assembly adapted to be attached to a device to be vibrated, comprising a bearing supported, motor driven, non-eccentric shaft bearings for the shaft; first weight means eccentrically rigidly mounted on said shaft for rotation therewith; and balancing second weight means, axially displaced from said first weight means, eccentrically mounted for rotation on said shaft; stop means on said first and second weight means limiting rotation of said second weight means on said shaft to a few degrees less than 180° from a position substantially 180° removed circumferentially from said first weight means to a shaft vibrating position just short of angular alignment with said first weight means in which the rotation of the shaft is imparted to said second weight means and the weights vibrate the shaft and bearings; the eccentricity and total weight of the second weight means relative to the eccentricity and total weight of the first weight means being so related that in the 180° removed position the first and second weight means substantially balance radially to provide a substantially vibrationless rotation of the assembly in this position; and motor means driving said shaft in a direction of rotation such that a slackening of speed of the shaft in the relative angular vibration inducing position of the first and second weight means coupled with the momentum of the second weight means will remove the second weight means angularly relative to the first weight means to the removed balanced position.

4,312,243
CHANGE-UNDER-LOAD TRANSMISSION

Hans Gött; Josef Ritter; Gerhard Ritter, and Klaus Ritter, all of Graz, Austria, assignors to EVG Entwicklungs -u. Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed May 7, 1980, Ser. No. 147,535
Claims priority, application Austria, May 9, 1979, 3462/79
Int. Cl.³ F16H *3/22*
U.S. Cl. 74—346 **6 Claims**



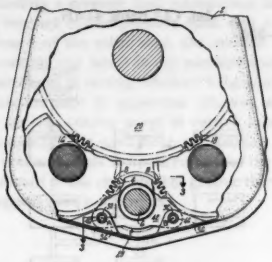
1. A change-under-load transmission having an input shaft and an output shaft; a pair of gearwheels on each of said input and output shafts; two pairs of coaxial shafts, said pairs of coaxial shafts being aligned axially with one another; a friction coupling element at the end of each of said coaxial shafts adjacent the other pair of coaxial shafts, said coupling element having a coupling face, and a gearwheel at the other end of each of said coaxial shafts, said gearwheels being adapted to be in permanent mesh with an associated one of said gearwheels on said input or output shaft respectively; and a central friction coupling element disposed between the adjacent ends of said two pairs of coaxial shafts, said central coupling element being adapted to be freely slidable axially with respect to said pairs of coaxial shafts; correspondingly positioned ones from said pairs of coaxial shafts being slidable axially inwards independently of one another out of a rest position, and the other shaft of each of said coaxial pairs being axially immovable; and said coupling faces of said coupling elements on said slidable shafts being disposed nearer said central coupling element than said coupling faces of said coupling elements on said axially immovable shafts.

4,312,244

POWER GEARING

Philip E. Barnes, West Hartford, and Millard G. Mayo, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 24, 1980, Ser. No. 143,237
Int. Cl.[3] F16H 57/12, 1/06
U.S. Cl. 74—410 4 Claims



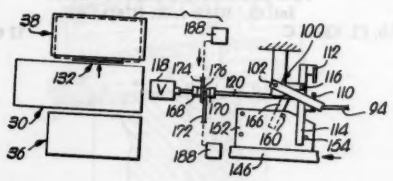
1. A compound power gearing including:
a gear box;
an input pinion in said box;
a pair of idler gears on parallel axes in said box and meshing with said pinion;
an output shaft driven from idler gears and mounted in said box;
a yoke supporting said pinion for rotation in said box;
a hinge pin carried by said box parallel to the axis of said pinion and pivotally supporting said yoke in such a manner that said yoke may pivot about said pin; and
a second pin spaced from and parallel to said hinge pin and engaging said box and yoke to limit the pivotal movement of the yoke about the hinge pin.

4,312,245

VALVE CONTROL MECHANISM

Thomas G. Schrag, Newton; Amos G. Hill, and Howard R. Lohrentz, both of Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 860,152, Dec. 14, 1977, Pat. No. 4,215,964.
This application Aug. 17, 1979, Ser. No. 67,372
Int. Cl.[3] G05G 5/06
U.S. Cl. 74—529 5 Claims



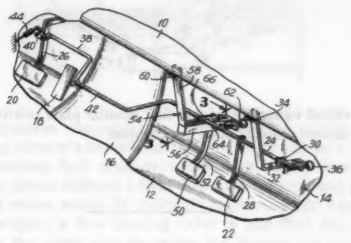
1. Valve control means comprising:
an axially reciprocable stem adapted for force-transmitting connection to a valve;
means coupled with said stem for effecting said reciprocation thereof;
a pair of shoulders spaced along said stem and movable therewith between a pair of opposite, operated positions; and
a pair of blocking bars offset in an axial direction relative to said stem for respective ones of said shoulders,
each of said bars being shiftable independently of the other transversely of said stem into and out of a position between said shoulders blocking movement of its corresponding shoulder to said operated position thereof.

4,312,246

DUAL OPERATING SYSTEM FOR CONTROLLING A BRAKE OR THE LIKE, INCLUDING A COUNTER SYSTEM TO PREVENT OR REVERSE OPERATION

Zina V. Barresi, 900 Old Medford Ave., Medford, N.Y. 11763

Filed Dec. 26, 1979, Ser. No. 106,546
Int. Cl.[3] G05G 1/16, 11/00
U.S. Cl. 74—562.5 16 Claims



1. An educational driving vehicle with which a passenger-teacher instructs a driver-student to drive, said vehicle comprising driver-student braking means, passenger-teacher braking means to override the driver-student braking means to effect a braking of said vehicle, and counter braking means positioned for operation by the passenger-teacher to prevent or reverse the operation of the driver-student braking means by the driver-student, the passenger-teacher braking means and the counter braking means comprising adjacent pedals spaced from but coupled to the driver-student braking means, the driver-student braking means including a pedal coupled to the pedal of said passenger-teacher braking means, a support and a rod extending from said support, the pedal of said teacher braking means being coupled to said rod, the pedal of said driver-student braking means being coupled to said rod at a position further from said support than where the pedal of said passenger-teacher braking means is coupled to said rod, both said passenger-teacher braking means and driver-student braking means being adapted to deflect said rod in substantially the same direction, the counter braking means being detachably coupled to said rod and being adapted to deflect the rod in the direction generally opposite the first said direction.

4,312,247

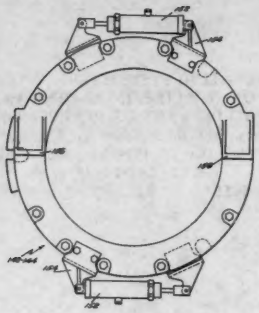
VIBRATION REDUCING MOUNT SYSTEM

Giovanni J. Silvestri, 4 Meadowbrook Dr., Barrington, R.I. 02806

Filed May 18, 1977, Ser. No. 798,058
Int. Cl.[3] F16F 15/22; F16D 3/17, 3/28
U.S. Cl. 74—574 5 Claims

1. A vibration reducing mount system for supporting a rotary machine about its center of rotation comprising:
a first annular plate having a first face thereof detachably secured to the rotary machine;
a second annular plate having a first face thereof detachably secured to ground;
a flexible annular ring having a first face thereof attached to a second face of said first annular plate and a second face thereof attached to a second face of said second annular plate; and

damping means being applied transversely across said first annular plate and said second annular plate whereby tor-



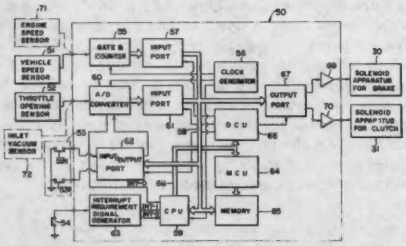
sional vibrations of said first annular plate relative to said second annular plate are damped.

4,312,248

METHOD FOR VEHICLE SUB-TRANSMISSION SHIFT CONTROL

Hiroshi Sugimoto, Aichi, and Jiro Nakano, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 24, 1979, Ser. No. 60,003
Claims priority, application Japan, Dec. 4, 1978, 53/150347
Int. Cl.³ B60K *41/10, 41/06;* F16H *37/00*
U.S. Cl. 74—861 **6 Claims**



1. A shift control method for a subtransmission of a vehicle is also equipped with a manual transmission operated by a driver, said method comprising the steps, in order, of:

detecting said driver's shifting of said manual transmission at a certain gearing ratio;

measuring a value of a parameter related to vehicle speed and a value for throttle opening at said driver's shift point of the manual transmission set to said certain gearing ratio;

determining, on the basis of said certain gear ratio, and the value of said measured parameter values, a sub-transmission shift line for said certain gear ratio, said shift line indicating the relationship between said parameter related to the vehicle speed and the throttle opening when said sub-transmission is to be shifted;

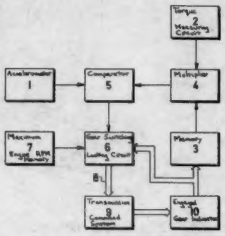
and performing shift control of the sub-transmission in accordance with said sub-transmission shift line, while the manual transmission is set to said gearing ratio.

4,312,249

METHOD OF CONTROL OF AN AUTOMATIC TRANSMISSION AND A PROGNOSTIC CIRCUIT FOR EXECUTION OF THIS METHOD

Antonin Hau, and Ctirad Pechacek, both of Prague, Czechoslovakia, assignors to Nauchen Institute po Ortopedia i Travmatologia, Sofia, Bulgaria

Filed Jul. 9, 1980, Ser. No. 167,138
Claims priority, application Czechoslovakia, Jul. 10, 1979, 4820-79
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—866 **5 Claims**



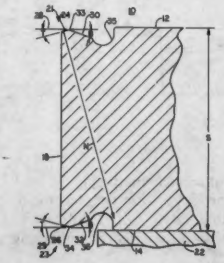
1. Method of controlling a vehicles' automatic transmission provided with an electronic control system by preventing the transmission from switching to a next higher gear under certain conditions, comprising the steps of measuring the instantaneous acceleration of the vehicle to provide an acceleration signal, measuring the delivered torque of the engine to the vehicle to provide a torque signal, multiplying the delivered torque signal by a constant related to at least the vehicle mass, inertia masses and the respective transmission ratio of the gear next highest to the engaged gear to provide a product signal, subtracting the acceleration signal from the product signal to provide a predicted acceleration signal, preventing the automatic transmission from switching to the next highest gear in response to a predicted acceleration signal indicating a predicted acceleration less than zero.

4,312,250

CUTTING INSERT AND METHOD OF MACHINING THEREWITH

Gerald K. Yankoff, 4417 Kitty La., Batavia, Ohio 45103

Filed Jan. 16, 1980, Ser. No. 112,643
Int. Cl.³ B23B *1/00;* B26D *1/00*
U.S. Cl. 82—1 C **12 Claims**



1. A one-piece indexable cutting insert for a machine tool which comprises opposed support faces and side walls, at least one of the side walls being provided with cutting edge portions along spaced lengthwise edges, each cutting edge portion including a pressure land intersecting the side wall and extending inwardly therefrom, a relief land inboard of the pressure

land and extending inwardly from a line of intersection with the pressure land, and a chip breaker groove inboard of the relief land, the pressure lands diverging from said one of the side walls at such an angle that a normal to one of the pressure lands is directed into an opposed one of the support faces inboard of the chip breaker groove thereof.

11. A method of machining a workpiece using a machine tool employing an indexable cutting insert having opposed support faces and at least one side wall having cutting edge portions along spaced lengthwise edges, each cutting edge portion including a pressure land intersecting the side wall, a relief land inboard of the pressure land, and a chip breaker groove inboard of the relief land, the method including the steps of mounting the insert in the machine tool with one of said presssure lands in cutting relation to the workpiece and an opposed support face in supported relation, advancing the workpiece and the cutting insert in cutting relation to effect metal removal from the workpiece, and causing forces on said one of the pressure lands to be directed into the opposed support face inboard of the chip breaker groove thereof where the opposed support face is supported.

4,312,251

CUTTING TOOL

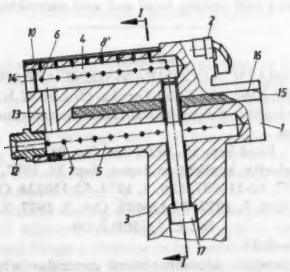
Werner Schwan, Pohlheim, Fed. Rep. of Germany, assignor to Heyligenstaedt & Comp. Werkzeugmaschinenfabrik GmbH, Geissen, Fed. Rep. of Germany

Filed Jun. 18, 1980, Ser. No. 160,690

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928756

Int. Cl.³ B23B *29/00*; B26D *1/00*

U.S. Cl. 82—36 R **7 Claims**



1. A cutting tool for machine tools comprising:

(a) A clamp holder carrying a cutting plate at one portion thereof;

(b) At least one coolant pipe disposed within said clamp holder transverse to the cutting plate and terminating at a distance from said cutting plate;

(c) A covering over at least part of said clamp holder and spaced therefrom; and

(d) A multiplicity of outlet holes from said coolant pipe into the space between the covering and the clamp holder.

4,312,252

FOOD SLICERS

John M. Duddridge, Barnham, England, assignor to Danepak Ltd., England

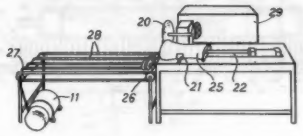
Division of Ser. No. 827,633, Aug. 25, 1977, Pat. No. 4,181,053, which is a continuation of Ser. No. 700,987, Jun. 29, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,364

Claims priority, application United Kingdom, May 25, 1976, 22215/76

The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—80 **7 Claims**



1. Apparatus comprising in combination a conveyor for receiving slices of a foodstuff as they are cut by a slicer, a pump for generating fluid pressure, a motor driven by said fluid pressure, means defining a fluid flow path between said pump and said motor, means for drivingly connecting said motor to said conveyor, a flow limiting valve in said fluid flow path between the pump and the motor for limiting the speed at which said motor drives said conveyor, and means for periodically and temporarily bypassing said flow limiting valve thereby to periodically and temporarily increase the fluid flow to the motor and accelerate the motor and conveyor.

4,312,253

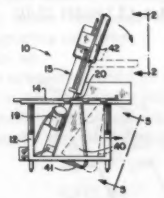
REMOVABLE SCRAP CATCHER ENCLOSURE FOR A BAND SAW

Thomas M. Johnson, Troy; John E. Voorhees, Sidney, and Raymond P. Shaeffer, Troy, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed May 19, 1980, Ser. No. 151,214

Int. Cl.³ B23D *55/00*

U.S. Cl. 83—167 **9 Claims**



1. For use in a band saw having a frame, a band saw blade for cutting products such as meat or the like, means mounting said blade for movement relative to said frame, said mounting means including a band wheel rotatably mounted on said frame and movably supporting said blade, removable catching means for catching and retaining debris produced during said cutting of products for subsequent removal from said saw, said removable catching means comprising:

a. an enclosure for substantially covering said band wheel, said enclosure having an external shape forming a compartment about at least one side of said band wheel; and

b. manually operable mounting means for manually mounting and removing said enclosure on and from said one side of said band wheel without the use of tools and having means defining a pivot on said frame for rotating said enclosure downwardly around a lower end thereof, as said enclosure is being removed from the band saw while

retaining the collected debris within said compartment for removal from the band saw.

4,312,254

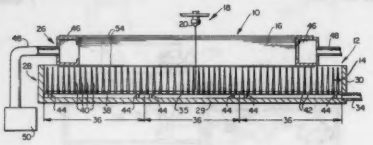
FLUID JET APPARATUS FOR CUTTING SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Oct. 7, 1977, Ser. No. 840,274

Int. Cl.³ D06H *7/00*

U.S. Cl. 83—177 **21 Claims**



1. Apparatus for cutting sheet material comprising a bed including a base having a multiplicity of axially vertically elongated and horizontally spaced apart members projecting upwardly therefrom and a multiplicity of fluid passageways extending therethrough between said members, said members having free upper ends disposed in a common plane and defining a fluid permeable sheet material supporting surface, a fluid jet cutting tool mounted above said supporting surface and including a jet nozzle directed toward said fluid permeable supporting surface to impinge a high velocity jet of cutting fluid upon sheet material supported on said fluid permeable supporting surface, and controlled positioning means for moving said fluid jet cutting tool relative to said fluid permeable supporting surface with said jet nozzle directed toward said fluid permeable supporting surface.

4,312,255

ARRANGEMENT FOR EDGE TRIMMING OF A MOVING MATERIAL WEB

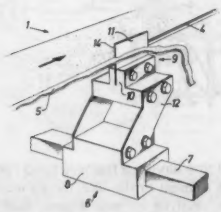
Sven N. H. Holmström, Löberöd, Sweden, assignor to Tetra Pack International AB, Lund, Sweden

Filed Nov. 28, 1979, Ser. No. 98,046

Claims priority, application Sweden, Dec. 7, 1978, 7812597

Int. Cl.³ B65H *35/02*

U.S. Cl. 83—582 **5 Claims**



1. An edge trimming device for use in trimming a moving laminate web which includes a carrier layer and at least one outer layer comprising:

cutting means for cutting an edge portion of the laminate web;

resiliently biased support means supporting the cutting means with said support means being capable of lateral movement while permitting the cutting means to remain substantially perpendicular to the laminate web;

a movable base to which said support means is connected and means to urge the cutting means against the edge of the carrier layer of the laminate web;

a cutting means holder, said support means disposed on either side of the cutting means holder, said support means supporting the cutting means and said cutting means holder with said support means and said movable base forming a parallelogram-like structure; and

wherein said support means consists of leaf springs.

4,312,256

CUTTING TOOL ARRANGEMENT

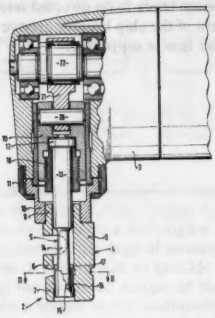
Reinhold Herzog; Helmut Roth, both of Neuhausen, and Günther Berger, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7, 1980, Ser. No. 147,090

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929882

Int. Cl.³ B23D *27/02*

U.S. Cl. 83—694 **5 Claims**



1. A cutting tool arrangement for a nibbler having two movable one relative to the other tool elements, comprising a cutting tool including a support shaft carrying a cutting head, and a die, said support shaft being adapted for reciprocating movement with respect to said die and including an elongated portion, a narrowing intermediate portion, and an end portion, said cutting head engaging said end portion and a part of said narrowing portion adjacent said end portion and being soldered to said narrowing portion and said cutting head to thereby prevent fatigue concentration stresses at a transition zone between said cutting head and said narrowing portion.

4,312,257

AUTOMATIC ACCOMPANIMENT APPARATUS

Hiroshi Kato, Ageo, and Kohji Tanaka, Ora, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sep. 15, 1978, Ser. No. 942,495

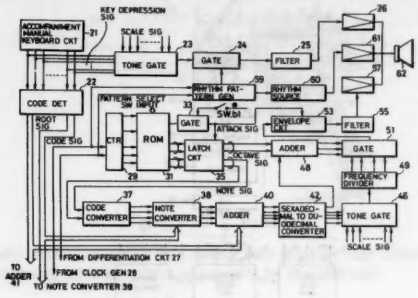
Claims priority, application Japan, Sep. 24, 1977, 52-114956; Sep. 24, 1977, 52-114957; Oct. 1, 1977, 52-118334; Oct. 1, 1977, 52-118335; Oct. 7, 1977, 52-120685; Oct. 7, 1977, 52-120686

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **5 Claims**

1. An automatic accompaniment apparatus which is provided with an auto-bass circuit comprising a code detector for detecting both root signal, and a code signal representing the chord type of the bass pattern to be produced from depressed key information derived from a keyboard circuit to output both the root signal and the code signal in the form of binary numbers, a memory circuit for storing note information, representing rhythm patterns in one root key and one chord type and sequentially outputting note signals of the note information in the form of binary numbers in accordance with the output from a counter directly connected to the memory circuit, a note converter receiving the note signals from the memory circuit and the code signal from the code detector and convert-

ing each of the note signals from the memory circuit by the code signal from the code detector to a note signal corresponding to the kind of the code of the code signal, an adder for



adding to the output from the note converter the root signal from the code detector, and a tone converter for converting the output from the adder to a tone signal.

4,312,258

BATTERY POWERED ELECTRONIC GUITAR

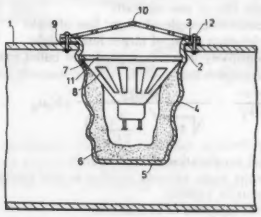
Hun S. Park, Seoul, Rep. of Korea, assignor to Hyo-San Industries Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 6, 1979, Ser. No. 91,740

Claims priority, application Rep. of Korea, Nov. 16, 1978, 78-5815[U]

Int. Cl.³ G10H *3/00*; H05K *5/00*

U.S. Cl. 84—1.16 **2 Claims**



1. In an electric guitar having edge portions in its top board surface defining an opening for receiving a speaker in the body interior of the guitar, wherein the improvement comprises:

a rubber cup having a body wall extending into the interior of the guitar through said top board opening, said cup having a circumferential flange at its open end disposed to overlie the edge portions of said top board surface defining said board opening;

said cup further having a circumferential groove formed in its wall adjacent said flange, said groove being spaced from said flange a distance to be located in the interior of the guitar adjacent the inner surface of said top board when said cup is positioned within the board opening of said guitar;

a sound insulating material coated on the interior surfaces of the wall of said cup;

said speaker having a rim engageable with said cup wall groove for mounting said speaker within said cup;

a cap positioned over said board opening and having its peripheral edge disposed to overlie the flange of said cup; and

fastening means extending through the peripheral edge of said cap, the flange of said cup and said top board surface for securing said cap and said cup to said guitar;

whereby said rubber cup and said insulating material within said cup together cooperate to prevent undue vibrations from being transmitted from said speaker to the body of said guitar.

4,312,259

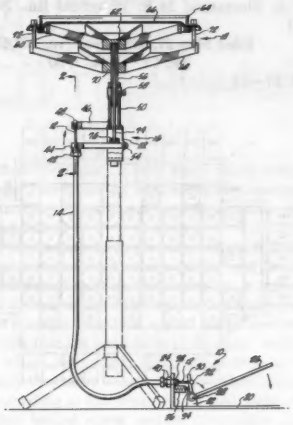
PEDAL ADJUSTABLE DRUM

Robert J. Henrit, London, England, assignor to Remo, Inc., North Hollywood, Calif.

Filed Aug. 20, 1979, Ser. No. 67,737

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—411 A **9 Claims**



1. A pedal adjustable drum assembly comprising

a drum having a drumhead stretched over a tensioning ring and affixed to a counter hoop, said ring being attached to a central hub by members radiating from said hub,

a push rod adapted to engage said hub opposite said drumhead such that the tension exerted on said drumhead is increased when said push rod is forced against said hub,

pivoted lever means adapted to engage said push rod opposite said hub,

support bracket means connected to said pivoted lever means for supporting said drum,

foot pedal means, and

actuating means connecting said foot pedal means and said pivoted lever means for pivoting said pivoted lever means against said push rod upon actuation of said foot pedal means and thereby varying the pitch of said drum.

4,312,260

FLEXIBLE CABLE

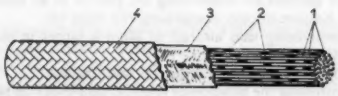
Gilbert Morieras, Paris, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Sep. 10, 1979, Ser. No. 73,805

Claims priority, application France, Sep. 22, 1978, 78 27462

Int. Cl.³ D04C *1/12*; H01B *7/02*

U.S. Cl. 87—1 **7 Claims**



1. In a flexible cable comprising a plurality of substantially parallel, textile core threads forming a core and an external sheath surrounding the core in which binder material binds the

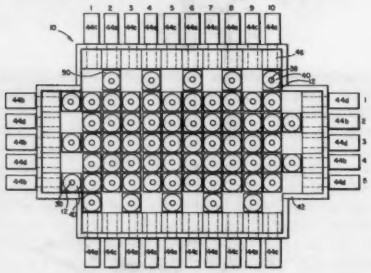
core threads to one another and the core to the sheath, the improvement that the core threads are bonded to one another with a binder material in a discontinuous manner, the binder material being applied to the threads in spaced apart longitudinal lengths along the core such that a bonded length of a given thread coincides at most only partially with a bonded length of adjacent threads.

4,312,261

APPARATUS FOR WEAVING A THREE-DIMENSIONAL ARTICLE

Robert A. Florentine, 26 S. Wakefield Rd., Norristown, Pa. 19401

Filed May 27, 1980, Ser. No. 153,623
Int. Cl.³ D04C 1/00
U.S. Cl. 87—33 **12 Claims**



1. An apparatus for weaving a three-dimensional article from a plurality of weaving elements comprising:

a plurality of generally cube-shaped carrier members, each carrier member including a separate weaving element supply mounted thereon to feed a weaving element from the carrier member to a plane of fabrication;

supporting means for releasably maintaining the carrier members in a matrix of columns and rows to form a carrier plane generally parallel to the fabrication plane including magnetic means disposed within the sides of said cube-shaped carrier member lying within the carrier plane, said magnetic means interacting to releasably maintain said carrier members in said columns and rows within said carrier plane;

movement means for moving said carrier members in predetermined paths relative to each other in the carrier plane to intertwine said weaving elements to form said woven article; and

take-up means for drawing the woven article away from the carrier plane.

4,312,262

RELATIVE VELOCITY GUNSIGHT SYSTEM AND METHOD

Gene Tye, Endwell, N.Y., assignor to General Electric Company, Binghamton, N.Y.

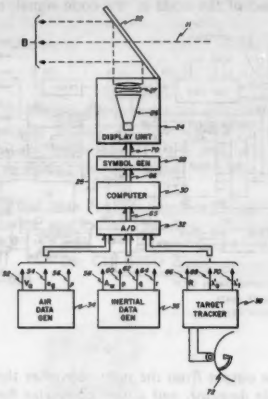
Filed Feb. 22, 1979, Ser. No. 13,977
Int. Cl.³ F41G 3/22
U.S. Cl. 89—41 EA **14 Claims**

1. A method for controlling the gunfire of an aircraft utilizing a headup display comprising the steps of:

maneuvering said aircraft to align a target in said headup display;

projecting a sighting index on said display;

controlling the position of said sighting index on said display so that it appears in the immediate vicinity of said target and moves in the direction and with the velocity that a target appearing at the same relative position on said display would have to have to intercept, one bullet flight-time later, a bullet fired from said aircraft, the motion of said sighting index being defined by the rate of change of



traverse and elevation display coordinate angles λ_t and λ_e as:

$$-\dot{\lambda}_t = K\left(r + \frac{\lambda_t'}{T_n}\right) - p\lambda_e'$$

$$-\dot{\lambda}_e = K\left(q + \frac{A_g'}{T_n} + P_r\right) + p\lambda_t'$$

where K = a constant less than 1 and greater than 0.67
r = yaw rate of said aircraft
p = roll rate of said aircraft
q = pitch rate of said aircraft
λ_t' = transverse angle of target line of sight
λ_e' = elevation angle of target line of sight
T_n = sensitivity in terms of predicted bullet time of flight
P_r = precession rate

$$= \frac{A_w}{2V_f} - \frac{0.00625}{\sqrt{V_m}\left(ft\frac{V_a}{2V_m}\right)}\rho V_a a_g$$

where A_w = lift acceleration of said aircraft
V_f = bullet mean velocity relative to said aircraft
V_m = muzzle velocity
V_a = true airspeed of said aircraft
a_g = gun angle of attack
ρ = relative air density

additionally maneuvering said aircraft to null the apparent relative motion of said target and said sighting index; and firing said aircraft gun when said relative motion appears to be zero.

4,312,263

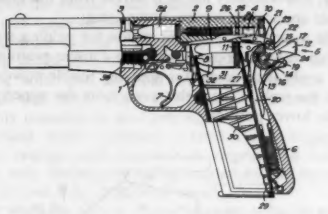
PISTOL

Maurice V. Bourlet, Liege, Belgium, assignor to Fabrique Nationale Herstal, en abrege F.N., Herstal, Belgium

Filed Dec. 4, 1979, Ser. No. 100,259
Claims priority, application Belgium, Jan. 10, 1979, 57535; May 21, 1979, 57809
Int. Cl.³ F41D 11/02
U.S. Cl. 89—154 **6 Claims**

1. Improved pistol of the type comprising a body carrying a moving slideway supporting a barrel and a firing-pin, the device actuating the said firing-pin consisting of a kinematic chain comprising a detent pivoting on the body, levers driving a sear and a hammer pivoting on the body, said hammer being

subjected to the action of a spring and controlled by the said sear, characterized in that the said hammer is mounted coaxi-



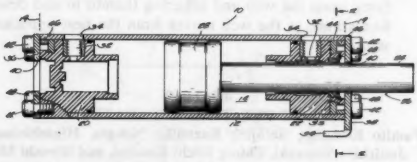
ally with at least one ring having two stops for said hammer, said ring having a notch engageable by the said sear.

4,312,264

FLUID PRESSURE OPERATED CYLINDER ASSEMBLY

Hermann A. Nunnemacher, Nashotah, and Peter Weil, Jr., Greenfield, both of Wis., assignors to Galland Henning Nopak Inc., Milwaukee, Wis.

Filed Jun. 9, 1978, Ser. No. 914,040
Int. Cl.[2] F16J *15/18, 11/02*
U.S. Cl. 92—161 6 Claims



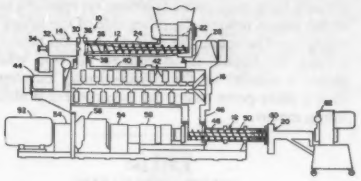
1. A fluid pressure operated cylinder assembly comprising:
an elongated barrel of a square shape in cross-section having a cylindrical bore extending longitudinally therethrough and defining longitudinally extending corners at spaced points around said bore, said elongated barrel having end faces at the opposite ends thereof extending transversely with respect to said longitudinally extending corners and defining cylinder end planes bounding the opposite ends of said cylindrical bore,
a cylinder head positioned entirely within said cylindrical bore, said head extending adjacent one of said cylinder end planes, said cylinder head being composed of plastic and including an annular mounting ring molded therein and spaced from and facing said one of said cylinder end planes,
an end plate,
first means, exterior of said cylindrical bore, for securing said end plate in facial abutment to one of said barrel end faces and adjacent said cylinder head, and
second means for securing said cylinder head to said end plate to longitudinally fix said head in position within said cylindrical bore, said second securing means comprising an annular thrust ring having an inner diameter greater than the inner diameter of said mounting ring and extending between said annular ring and said end plate, and screws extending entirely through said end plate and into said mounting ring for drawing said mounting ring into fixed engagement with said thrust ring, and for drawing said thrust ring into fixed engagement with said end plate.

4,312,265

SCREW FOR EXTRUDING A FOOD MASH

William R. Enterline; Dennis G. De Wald, both of Muncy, and James R. Boose, Montgomery, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 29, 1980, Ser. No. 154,368
Int. Cl.[3] A47J *27/14*
U.S. Cl. 99—348 11 Claims



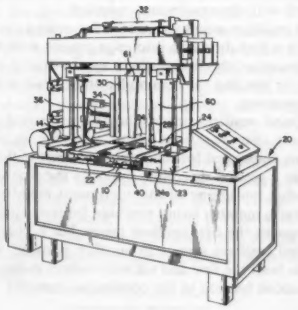
1. Apparatus for extruding a food mash which comprises:
(a) an extruder barrel having inlet and outlet openings; and
(b) a substantially coextensive extruder screw disposed within said barrel;
(c) said extruder screw having a single flight helical screw section initiating at said inlet opening and terminating within said barrel, which initial section is immediately thereafter followed by a flightless section having a plurality of bars arranged in axially spaced planes and extending radially to within the proximity of the inner walls of said extruder barrel and which flightless section, in turn, is immediately thereafter followed by a further helical screw section extending to the proximity of said outlet opening, said further helical screw section comprising at least a double flight section.

4,312,266

OBJECT-TURNING APPARATUS FOR A HIGH-SPEED STRAPPING MACHINE

James A. Pasic, Montesano, Wash., assignor to Ovalstrapping, Inc., Hoquiam, Wash.

Continuation-in-part of Ser. No. 154,754, May 30, 1980, abandoned. This application Feb. 6, 1981, Ser. No. 232,012
Int. Cl.[3] B65B *13/04*
U.S. Cl. 100—7 16 Claims



1. An object-turning apparatus for a high-speed strapping and conveying machine, comprising:
(a) conveying means having a high-friction conveying surface for rapidly moving an object into and out of a strapping station;
(b) at least two object-turning members at the strapping station spaced on opposite sides of the conveying surface and longitudinally spaced along the conveying surface for engaging the object on opposite sides, one member engag-

ing the forward half and the other engaging the rearward half of the object;

(c) means for lifting the object off the conveying surface at the strapping station, the means having a low-friction surface to make rotation of the object easier;

(d) strapping means for placing a first strap around the object at the strapping station, and thence a second strap around the object after the object is rotated; and

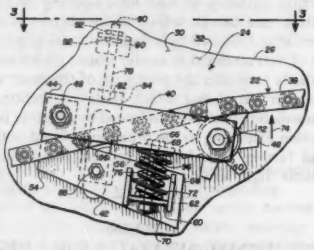
(e) means for moving the object-turning members simultaneously from their initial positions on opposite sides of the lifting means toward the other side of the lifting means to engage and to rotate the object, and stop means for positioning the bundle in its rotated position whereby the object is rotated by the object-turning members into at least a three-point triangular engagement position on the lifting means.

4,312,267

IDLER APPARATUS

Paul S. Shenberger, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 31, 1980, Ser. No. 135,956
Int. Cl.³ B30B *1/00*; F16H *7/12*
U.S. Cl. 100—179 **6 Claims**



1. An idler apparatus comprising:

(a) a driving member connected to a supportive frame;

(b) a driven member;

(c) a continuous member operatively connecting the driving and driven members;

(d) an arm member;

(e) an idler member connected to the arm member and engaged with the continuous member;

(f) first resilient means connected for urging the idler member in a first direction into engagement with the continuous member, the first resilient means having a first spring rate for limiting the accumulation of slack in the continuous member;

(g) second resilient means having a second spring rate greater than the first spring rate, the second resilient means connected for limiting movement of the idler member in a second direction, opposite the first direction for resisting tensioning of the continuous member; and

(h) the arm member being movable from one position where it engages the first resilient means but is spaced from the second resilient means to another position where it engages both the first and second resilient means in response to sudden tension in the continuous member.

4,312,268

APPARATUS AND METHOD FOR COATING OF INKS APPLIED AT HIGH SPEED

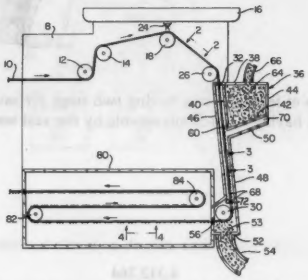
George E. King, and Hugh B. Skees, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Dec. 10, 1979, Ser. No. 101,493
Int. Cl.³ B05B *1/08*
U.S. Cl. 101—1 **9 Claims**

1. Print apparatus in which a web has ink applied thereto in desired formations at a first station by ink jet print mechanism while the web travels at a high rate, the web moving from the first station to a second station and from the second station to a heat application station at a high rate, the ink being wet, watery, low-viscosity ink as it moves from the first station to the heat application station, comprising:

guide means at the second station for guiding travel of the web from an upper position to a lower position,

and application means for applying fusible powder material to the web as the web travels from the upper position to the lower position,



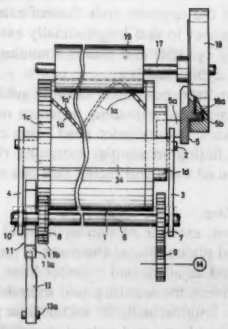
a portion of the fusible powder material adhering to the wet watery ink on the web, non-adhering fusible powder material falling downwardly and separating from the web prior to movement of the web to the heat application station, the adhering fusible powder material being fused at the heat application station, the powder material solidifying upon the web and adhering thereto in said desired formations, as the web moves from the heat application station.

4,312,269

DOT PRINTING APPARATUS

Fumito Komatsu, Shiojiri; Kazuhiko Nakata, Higashioizumi; Junichiro Sinozaki, Chino; Eiichi Kazama, and Hiroshi Morishige, both of Shimosuwa, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed May 7, 1980, Ser. No. 147,655
Int. Cl.³ B41J *3/08, 3/12*
U.S. Cl. 101—93.04 **5 Claims**



1. A printing apparatus for printing marks on a printing web comprising:

a printer body frame;

a single rotational drive motor for producing drive rotational force;

rotational force transmission means for transmitting the rotational force;

a drive wheel having a shaft which is rotatably supported to said printer body frame;

spring-biased link means rotatable around said shaft supported by the printer body frame;

printing web feeding means;

a printing drum having a helical one turn member having printing projections thereon, disposed so as to face the printing web, and supplied with the rotational force through said drive wheel at all times, said drum being rotatably mounted on said link means;

and interlock means including a ratchet gear engageable with a ratchet pawl movable in response to solenoid means, said ratchet gear being rotated by the rotational force derived from said drive wheel,

whereby when the ratchet gear is engaged with the ratchet pawl operatively moved by said solenoid means, by the rotational force derived from said motor, the ratchet gear is rotated and is slid on said ratchet pawl against the spring force of said link means, and said printing drum is rotated around said shaft of said drive wheel and contacts with the printing web backed-up by said printing means.

4,312,270
STENCIL DUPLICATOR

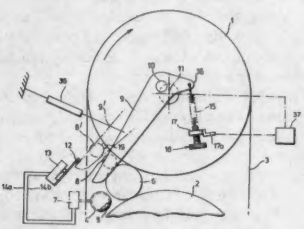
Albert G. R. Gates, London, England, assignor to Gestetner Limited, England

Filed May 8, 1979, Ser. No. 36,990

Claims priority, application United Kingdom, May 15, 1978, 20561/78

Int. Cl.³ B41L *13/08*

U.S. Cl. 101—122 **13 Claims**



1. In a twin-cylinder stencil duplicator including first and second cylinders each rotatable about a respective axis, an ink screen mounted on said first and second cylinders to carry a stencil for ink transfer between the surface of the first cylinder and the stencil by way of said ink screen, first and second ends to said first cylinder, and means for applying ink to the surfaces of said first and second cylinders; the improvement comprising means for automatically controlling the quantity of ink on said first cylinder, said last-mentioned means including:

(a) sensing roller means positioned adjacent the surface of said first cylinder and having first and second ends;

(b) means mounting said sensing roller means adjacent said first cylinder, said mounting means being effective to constrain each of the first and second ends of said sensing roller means for movement to and fro along a predetermined respective arcuate path which extends simultaneously both in a peripheral direction of the said first cylinder and radially of the first cylinder and is concave on its side facing the said axis of the first cylinder, said predetermined respective arcuate paths for said first and second ends of said sensing roller means being arranged so that said sensing roller means remains inwardly of said ink screen and radially outwardly of said first cylinder but out of contact therewith to contact instead a layer of ink on said first cylinder in use of the duplicator; and

(c) means responsive to movement of said first and second ends of said sensing roller means along said predetermined respective arcuate paths and effective to control ink supply from said ink applying means.

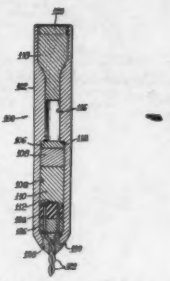
4,312,271
DELAY DETONATOR DEVICE

Edward A. Day, Rancho Santa Fe, Calif.; Glenn E. Seay, Los Alamos, N. Mex., and Petry B. Ritter, Encihitas, Calif., assignors to Systems, Science and Software, La Jolla, Calif.

Division of Ser. No. 11,150, Feb. 12, 1979, Pat. No. 4,239,004, which is a division of Ser. No. 703,601, Jul. 8, 1976, Pat. No. 4,144,814. This application Sep. 22, 1980, Ser. No. 189,717

Int. Cl.³ F42B *3/16*; F42C *19/12*

U.S. Cl. 102—202.13 **7 Claims**



1. A delay detonator device adapted for use at elevated temperatures approaching 600° F., comprising:

a cylindrical body having an internal chamber, one end of which communicates with an elongated bore of smaller inside diameter, the interface between the end of said chamber and said elongated bore defining an annular shoulder;

an impactor disk abutting said shoulder within said chamber;

a donor charge of a mixture of titanium hydride and potassium perchlorate located adjacent said impactor disk within said chamber;

a delay charge of pyrotechnic material having a slow burning characteristic positioned adjacent said donor charge within said chamber;

a high temperature acceptor charge positioned within said body at the downstream end of said bore;

a header backing material positioned adjacent said delay charge and having a bridge wire with electrical conductors connected at opposite ends thereof, said conductors passing through said header backing material and extending outwardly of said detonator device, said body portion near said header being swaged to tightly confine said header and said donor and delay charges; and,

ignition of said delay charge by said bridge wire causing said donor charge to be ignited after a predetermined delay time period, the burning of said donor charge creating high pressure that shears the central portion of said impactor disk interiorally of said shoulder and accelerates the same down said bore into igniting impact with said acceptor charge.

4,312,272
DETONATING CORD WITH FLASH-SUPPRESSING COATING

James J. Baker; Robert C. Sittig, and David A. Ciaramitaro, all of Benson, Ariz., assignors to Apache Powder Company, Benson, Ariz.

Filed Jun. 13, 1980, Ser. No. 159,255

Int. Cl.³ C06C *5/04*

U.S. Cl. 102—275.8 **40 Claims**

1. In a detonating cord comprising a core of explosive, a wrapped coating retaining said explosive and an extruded

coating surrounding said wrapped coating, the improvement which comprises a wrapped coating of a material comprising a

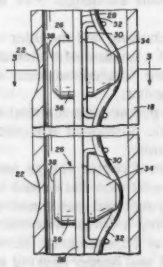
halogenated polymer of sufficient halogenation to prevent ignition of nearby external combustible materials upon detonation of the cord.

4,312,273

SHAPED CHARGE MOUNTING SYSTEM

Donald L. Camp, Mansfield, Tex., assignor to Shaped Charge Specialist, Inc., Mansfield, Tex.

Filed Apr. 7, 1980, Ser. No. 138,140
Int. Cl.³ E21B *7/00, 43/117;* F42B *3/08*
U.S. Cl. 102—310 **10 Claims**



6. A shaped charge system comprising:

an elongated panel having charge receiving apertures formed therethrough;

a shaped charge structure having a conical portion and an open-mouth cylindrical portion, said conical portion having a transverse groove in the apex thereof, said cylindrical portion having a reduced section adjacent said conical portion and of diameter about equal to the diameter of said apertures, said cylindrical portion having an enlarged section between said mouth and said reduced section and of diameter greater than said apertures, said enlarged section being stepped down to said reduced section by a radial shoulder such that said charge structure is insertable conical portion first into said panel aperture with a stop provided by engagement of said shoulder against said panel; and

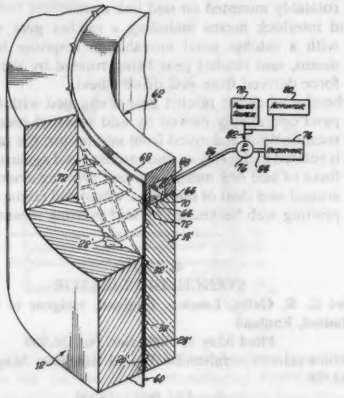
a spring wire clip mounted to said charge structure and engaging said panel on the opposite side from said shoulder to retain said charge structure in said aperture, said clip having hooks positioning a primer cord seated in said transverse groove.

4,312,274

METHOD FOR SELECTING WARHEAD FRAGMENT SIZE

Louis Zernow, Glendora, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Jan. 17, 1977, Ser. No. 759,945
Int. Cl.³ F42B *13/48*
U.S. Cl. 102—493 **16 Claims**



1. In a warhead comprising a casing and a cutting component disposed interiorly of said casing with each of said casing and said cutting components defining groove patterns formed therein for fragmenting said casing in a predetermined manner upon detonation of an explosive carried within said warhead, the improvement which comprises:

a fluid capable of inhibiting the cutting action of said cutting component when flowed into said groove pattern therein;

a reservoir carried within said warhead for containing said fluid; and

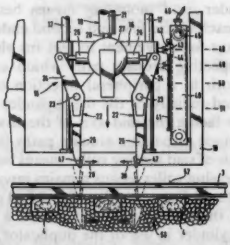
delivery means connected to said reservoir and communicating with said groove pattern in said cutting component for conducting said fluid from said reservoir to said cutting component groove pattern upon command.

4,312,275

IMMERSION DEPTH CONTROL FOR BALLAST TAMPING TOOLS

Josef Theurer, Vienna; Gernot Böck, Aschach, and Mihir Ganguly, Linz, all of Austria, assignors to Franz Plasser Bahnbaumaschi nen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 25, 1980, Ser. No. 115,505
Claims priority, application Austria, Feb. 26, 1979, 1470/79
Int. Cl.³ E01B *27/17*
U.S. Cl. 104—12 **6 Claims**



1. In a tamping machine mounted for mobility on track rails

fastened to ties supported on ballast, which comprises a machine frame, a tamping unit vertically movably mounted on the machine frame and including reciprocable and vibratory tamping tools immersible in the ballast upon vertical movement of the tamping unit and operable to tamp ballast under respective ones of the ties on reciprocation and vibration of the tamping tools, and a hydraulic drive for vertically moving the tamping unit, the hydraulic drive connecting the tamping unit to the machine frame: an automatic control arrangement for operating the hydraulic drive and for monitoring the vertical movement and a corresponding immersion depth of the tamping tools in the ballast, the control arrangement including

(a) a hydraulic fluid conduit circuit connected to the hydraulic drive,

(b) a control valve in the control circuit, the valve being capable of steplessly adjusting hydraulic fluid flow to the drive, and

(c) a control for regulating the velocity of the vertical movement in dependence on the vertical position of the tamping unit, the control having an input and an output connected to the valve for adjustment thereof,

(1) a first signal transmitter providing a continuous control signal indicating respective vertical positions of the tamping unit over the entire range of the vertical movement thereof and

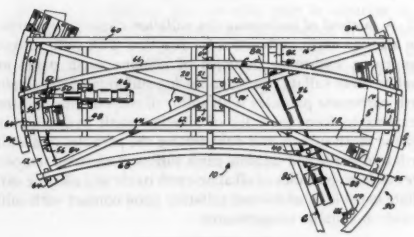
(2) a continuously adjustable second signal transmitter providing another control signal indicating desired immersion depths of the tamping tools in the ballast whereby the hydraulic fluid flow and the corresponding vertical movement velocity is regulated by a control signal derived from the signals of the first and second signal transmitters.

4,312,276

TURNTABLE JOINING TRACKS WITH LINEAR INDUCTION MOTOR CONTROL

Stanley A. Cory, Malibu; Millard G. Black, Santa Ana, and Gilbert J. Scholtz, La Puente, all of Calif., assignors to Walt Disney Productions, Burbank, Calif.

Filed Oct. 9, 1979, Ser. No. 82,692
Int. Cl.³ E01B 7/00
U.S. Cl. 104—38 **14 Claims**



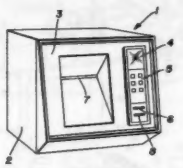
1. A turntable mechanism comprising a fixed support, a turntable mounted by an axle upon said fixed support and rotatable relative to said fixed support in alternative angularly displaced positions, a bi-directional linear induction motor coupled to said turntable and to said fixed support and having a stator element and also an armature element which is linearly movable relative to said stator element in both of two opposite linear directions, and a first of said linear induction motor elements is connected to said fixed support at a support attachment radially displaced from said axle and a second of said linear induction motor elements is connected to said turntable at a turntable attachment radially displaced from said axle and angularly displaced from said support attachment, whereby said linear induction motor is actuable to rotate said turntable in either direction of rotation relative to said fixed support.

4,312,277

REMOTE DEPOSITORY WITH SEALED DEPOSIT CONTAINER CONSTRUCTION

Harry T. Graef, Dover; Scott A. Mercer, Hanoverton, and Jeffrey A. Hill, North Canton, all of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Apr. 2, 1980, Ser. No. 136,528
Int. Cl.³ G07G 5/00
U.S. Cl. 109—24.1 **23 Claims**



1. Remote automatic banking depository equipment including a housing having a deposit envelope entry slot; belt conveyor means having entry and exit ends; the conveyor means entry end being located adjacent to but spaced from said entry slot; said conveyor means including a flat plate platen, a pressure plate, endless belt means looped around a pair of spaced belt conveyor rolls, and one flight of the belt means extending between and being movable along the platen from one conveyor roll to the other between said platen and pressure plates; said conveyor rolls being located respectively at the conveyor means entry and exit ends, and drive means for at least one of said conveyor rolls; a discharge opening formed in the platen adjacent the belt means; a barrier member pivotally mounted intermediate its ends on the conveyor means having an entry barrier plate and gate barrier plates, respectively, at its ends; said barrier member being movable between normally closed and open positions, the entry barrier plate being located in the space between the conveyor means entry end and said entry slot when the barrier member is in closed position, and said gate barrier plates being located above the platen and above said platen discharge opening when the barrier member is in normally closed position; a container having a deposit-receiving-opening, a lid for the deposit-receiving-opening movable relative to the container between open and closed positions and lock means for locking the lid in closed position; and said container with the lid in open position being located with its deposit-receiving-opening immediately beneath said platen discharge opening.

4,312,278

CHIP WOOD FURNACE AND FURNACE RETROFITTING SYSTEM

Norman Smith; John G. Riley, both of Orono; Edward R. Huff, Old Town, and Dwight C. Worcester, Winterport, all of Me., assignors to Board of Trustees of the University of Maine, Bangor, Me.

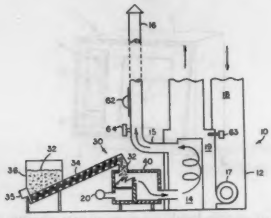
Filed Jul. 22, 1980, Ser. No. 171,138
Int. Cl.³ F23B 7/00
U.S. Cl. 110—234 **27 Claims**

1. A new and improved residential or small scale retrofitting furnace system for automatically controlled continuous and efficient combustion of fragmented wood type fuels such as chipped, hogged, and pellitized wood, bark, wood waste and logging residues, said retrofitting furnace system adapted for utilizing and retrofitting conventional oil fired hot air and hot water furnace systems of the kind having an oil combustion chamber, heat exchanger, and oil burner gun motor and firing means, said new retrofitting furnace system comprising:

wood type fuel combustion chamber means formed by an enclosure of refractory material for efficient combustion of the wood type fuel at elevated temperatures to substantially complete combustion;

fragmented wood type fuel feeding means for trickle feeding wood fuel fragments at selected uniform rates and for introducing the trickle fed fuel fragments into the wood type fuel combustion chamber means;

flame tube adapter means for coupling the wood type fuel combustion chamber with the oil combustion chamber of a conventional oil fired furnace to be retrofitted after the oil burner gun motor and firing means has been removed from such conventional oil furnace;



said wood fuel combustion chamber means adapted to receive an oil burner gun motor and firing means removed from the conventional oil furnace for igniting the fragmented wood type fuel during start up of the retrofitting furnace system;

means for establishing a draft through the retrofitted furnace system during start up of the system;

and control means for controlling and sequencing operation of the elements of the retrofitting furnace system.

4,312,279

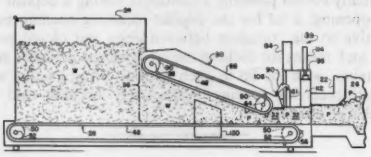
COMPACTOR-FEEDER FOR SOLID WASTE INCINERATOR

James C. Wilson, 2420 Thornridge Rd., and C. Conway Wilson, 2509 Fernbank Dr., both of Charlotte, N.C. 28211

Filed Oct. 6, 1980, Ser. No. 193,896

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—346 **52 Claims**



1. Compactor-feeder apparatus for a solid waste incinerator having a waste combustion chamber with a firebed therein and an entrance thereto communicating with the firebed comprising:

(a) a waste receiving hopper having an exit spaced from said combustion chamber entrance;

(b) lower conveyor means traversing the bottom of said hopper for transporting waste therefrom through said exit toward said combustion chamber entrance;

(c) upper conveyor means disposed above said lower conveyor means and extending convergently with said lower conveyor means toward said combustion chamber entrance for cooperating with said lower conveyor means for compacting said waste and forcing it into said combustion chamber to feed said firebed a continuous plug of compacted waste, said upper conveyor means having a convergent end mounted in spaced relation above said lower conveyor means, and said convergent end being spaced from said combustion chamber entrance to provide a fire break therebetween;

(d) an enclosed passageway from said convergent end of said upper conveyor means to said combustion chamber entrance for confining the compacted waste as it is being forced therethrough by said upper and lower conveyor means into said combustion chamber;

(e) a movable fire door selectively operable to open and close said combustion chamber entrance; and

(f) firestop means disposed at said passageway at a spacing from said combustion chamber entrance and selectively movable transversely in said passageway for opening of said firestop means for the compacted waste to be forced through said passageway, and for closing of said firestop means against the compacted waste therein with said firestop means imposing further concentrated localized compacting thereof, said firestop means being movable to completely close said passageway in the absence of waste therein, said firestop thereby serving to seal the waste in the hopper and between said conveyor means from any combustion occurring in the passageway between said firestop and fire door.

4,312,280

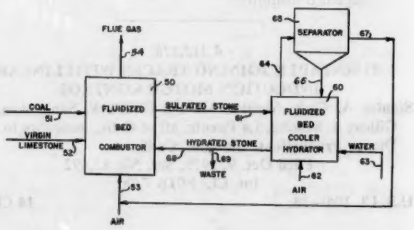
METHOD OF INCREASING THE SULFATION CAPACITY OF ALKALINE EARTH SORBENTS

John A. Shearer, Chicago; Clarence B. Turner, Shorewood, and Irving Johnson, Clarendon Hills, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1980, Ser. No. 129,932

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **24 Claims**



1. A method of increasing the sulfation capacity of particulate alkaline earth carbonates for reaction with sulfur dioxide comprising hydrating particles of alkaline earth oxide and alkaline earth sulfate produced during sulfation of the alkaline earth carbonate particles with sulfur dioxide at elevated temperatures to form particles of alkaline earth hydroxide and alkaline earth sulfate; and dehydrating the particles of alkaline earth hydroxide and alkaline earth sulfate at elevated temperatures to form particles of alkaline earth oxide and alkaline earth sulfate capable of additional sulfation upon contact with sulfur dioxide at suitable temperatures.

4,312,281

DEVICE FOR THE LINEAR TREATMENT OF A CURVED EDGE OF A SUPPLE PIECE OF FABRIC OR OTHER MATERIAL

Joël Doyen, Ste Savine, and Jean-Pierre Raisin, Troyes, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly, France

Filed May 21, 1980, Ser. No. 151,821

Claims priority, application France, May 29, 1979, 79 13659

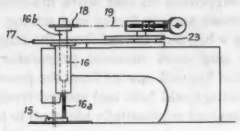
Int. Cl.³ D05B *19/00, 27/00, 35/10*

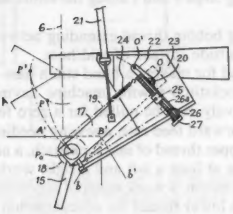
U.S. Cl. 112—121.11 **9 Claims**

1. An installation for the linear treatment, such as sewing, along a line whose direction remains substantially tangent to a curved edge of a supple piece such as a piece of fabric comprising: a linear treatment machine with a fixed station having a

fixed point of treatment; a guiding and driving device to make the piece pass through the point of treatment and to move, with respect to the treatment machine, the zone of the piece which is being treated, along a predetermined treatment axis, a work table extending around the driving device, the work table having a detection zone and being situated substantially above the point of treatment for supporting the piece during the treatment; and a correcting device comprising:

detecting means for detecting the presence of the piece at the detection zone of the work table situated upstream of the said point of treatment and on at least one side with respect to the axis of treatment, and re-centering means on the work table, controlled by the detection means for displacing the piece substantially transversely with re-





spect to the axis of treatment and in the appropriate direction, as a function of the presence of the piece on at least one point of the detection zone, in order that the piece be treated by the treatment machine along a line which extends substantially in parallel to the curved edge of the piece, wherein the re-centering means comprise a movable part of a work table offset with respect to the axis of treatment, moving in rotation about an axis perpendicular to the work table, and driving means controlled by the detector for driving the movable part in rotation in a suitable direction depending on the presence of the piece at the point of the detection zone, thereby causing the work table to support the piece to be treated and to re-center the piece during its linear treatment.

4,312,282

POSITIONING APPARATUS

Adolph S. Dorosz, Beverly, and John F. Martin, S. Essex, both of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 8,503, Feb. 1, 1979, abandoned. This application Mar. 20, 1980, Ser. No. 132,072

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 **22 Claims**

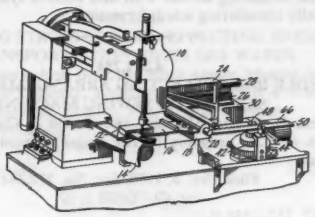
1. In an automatic sewing machine wherein an article is intermittently positioned relative to a sewing needle, apparatus for positioning the article comprising:

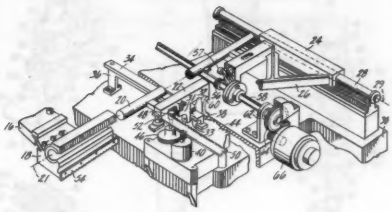
a frame which is mounted for movement in a predefined plane;

a carriage which is mounted for movement on said frame;

means, attached to said carriage, for securely holding the article in the predefined plane of movement for said frame;

means, remote from said frame, for intermittently moving said frame in a first direction; and





means, remote from said frame, for intermittently moving said carriage on said frame when said frame is also being moved in the first direction.

4,312,283

AUTOMATIC SEWING MACHINE HAVING CONTROL CIRCUIT RECEIVING A SIGNAL MEASURING ADJUSTMENT OF WORK RECEIVING MEANS

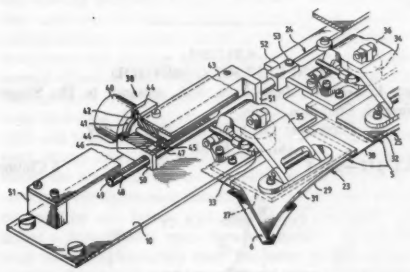
Jochen Fischer, Bielefeld, and Hans Scholl, Oerlinghausen-Lipperreihe, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,373

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938064

Int. Cl.³ D05B *21/00, 39/00*

U.S. Cl. 112—121.12 **8 Claims**



1. An automatic sewing machine for sewing workpieces of different size comprising: a sewing head having a needle and a sewing head drive; a workpiece receiving device having workpiece receiving elements adjustably arranged to each other for receiving workpieces of different sizes; a drive system including drive means for generating relative movement between a workpiece and said needle in two rectangular coordinate directions; and a programmable control system for controlling said sewing head drive and said drive means to produce a stitched contour in the workpiece, said control system including input

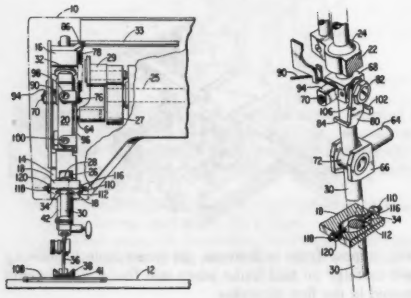
means for receiving information about said size adjustment of said workpiece receiving elements and comprising: a measuring device for steadily detecting said size adjustment of said workpiece receiving elements, and connecting means connecting said measuring device with said control system for automatically transferring size information.

4,312,284

NEEDLE BAR DEFLECTING ARRANGEMENT FOR A SKIP STITCH SEWING MACHINE

Kenneth D. Adams, Madison, and Gerald J. Creed, Rahway, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 3, 1980, Ser. No. 212,384
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 R **9 Claims**



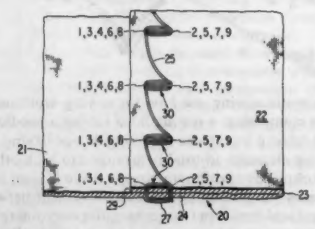
1. In a sewing machine, a needle bar, a gate supporting the needle bar for endwise reciprocation, latching means carried on the needle bar, actuating means for imparting endwise reciprocatory motion to the needle bar through said latching means, means for laterally jogging the gate and thereby the needle bar for zig-zag sewing and for moving the needle bar in one direction into a skip stitch position, means for unlatching the latching means from said actuating means in the skip stitch position of the needle bar, a cam surface on the needle bar, and means mounted in the machine to engage said cam surface in the event the unlatching means fails to operate and to thereby urge the needle bar in a direction opposite to said one direction to prevent the needle bar from moving a needle affixed thereto into an interferring relationship with a presser foot or throat plate.

4,312,285

HEM SECURING METHOD

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,059
Int. Cl.³ D05B *1/24*
U.S. Cl. 112—267.1 **6 Claims**



1. A method for making a blind stitch hem on a work material with a lockstitch sewing machine having a feed system which may be nulled for a zero feed rate, a sewing needle, a needle thread forming an upper thread of said lockstitch, a tension device for said upper thread, a needle positioning system having at least a left and a right work material needle penetrating position, a work material supporting bed and a bobbin for carrying a lower thread for concatenation with said needle thread in the formation of said lockstitches, said method comprising the steps of:

a. selecting a lower thread for said bobbin for a close match with said work material;

b. nulling said feed system to obtain a zero feed rate;

c. setting said needle positioning system for a sequence of left and right needle positions;

d. folding a hem on said work material with an outside surface supported on said work material supporting bed and an inside surface facing said sewing needle;

e. stitching a bar tack spaced from the edge of the hem;

f. moving said work material preparatory to stitching a subsequent bar tack spaced from the preceding bar tack so as to maintain said hem and spaced from the edge of the hem an amount substantially identical to the preceding bar tack;

g. repeating steps e and f along the entire extent of the hem; and,

h. trimming bobbin thread extending between said bar tacks on the outside surface of said hem.

6. A method for making a blind stitch hem on a work material with a lockstitch sewing machine having a feed system which selectively may be nulled for a zero feed rate and may be set for a forward feed rate, a sewing needle, a needle thread forming an upper thread of said lockstitch, a needle positioning system having at least a left and a right work material needle penetrating position, a work material supporting bed, a bobbin for carrying a lower thread for concatenation with said needle thread in the formation of said lockstitches, and means for selectively holding stitching in abeyance, said method comprising the steps of:

a. selecting a lower thread for said bobbin the color of said work material;

b. setting said needle positioning system for a selected sequence of left and right needle positions;

c. fashioning a hem on said work material with an outside surface supported on said work material supporting bed and an inside surface facing said sewing needle;

d. stitching a bar tack spaced from the edge of the hem with said feed system nulled to obtain a zero feed rate;

e. actuating said means for selectively holding stitching in abeyance while regulating said feed system to obtain a forward feed rate so as to reposition said work material preparatory to stitching a subsequent bar tack spaced from the preceding bar tack so as to maintain said hem and spaced from the edge of the hem an amount substantially identical to the preceding bar tack;

f. repeating steps d and e along the entire extent of the hem; and,

g. trimming bobbin thread extending between bar tacks on the outside surface of said hem.

4,312,286

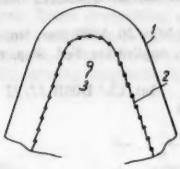
SEWING MACHINE ADAPTED TO STITCH ON A CURVED PATH

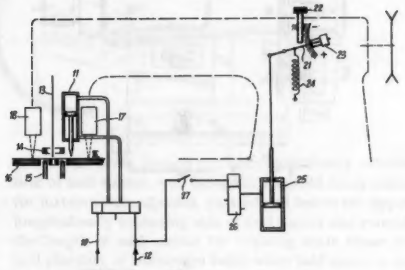
Gerard Biotteau, Les Zinnias, Saint Pierre Montlimart (Maine et Loire), France

Filed Apr. 29, 1980, Ser. No. 145,499
Claims priority, application France, May 11, 1979, 79 12011
Int. Cl.³ D05B *27/00, 27/22*
U.S. Cl. 112—308 **1 Claim**

1. In a sewing machine comprising automatic guide apparatus for the piece comprising a presser foot adapted to bear against the piece during operation so as to retard and turn the piece, a detector controlling the pressing of the presser foot, means for controlling the stitch length, and means for control-

ling the speed of operation of the machine; the improvement comprising means subjecting the means for regulating stitch length and the means for regulating the speed of driving of the





piece to the actuation of the presser foot in such a way as to increase the stitch length and reduce the speed for as long as the presser foot is applied.

4,312,287

APPARATUS FOR HANDLING SUBMERSIBLES AT SEA

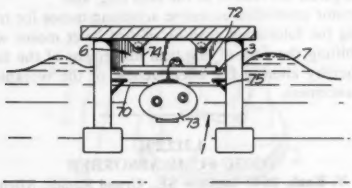
Chengi Kuo, Glasgow, Scotland, assignor to The University of Strathclyde, Glasgow, Scotland

Filed Sep. 27, 1978, Ser. No. 946,369

Claims priority, application United Kingdom, Sep. 30, 1977, 40637/77

Int. Cl.³ B63B *35/02*

U.S. Cl. 114—259 **3 Claims**



1. A semi-submersible comprising a deck, a plurality of columns supporting the deck above the surface of the sea, and buoyancy tanks for altering the draft of the semi-submersible between a raised transit position and a lower operating position, having a moonpool structure extending from deck level to a level which is above the waterline when the semi-submersible is in its raised (transit) position, and below the waterline when the semi-submersible is in its lower (operating) position, whereby when the semi-submersible is in its lower position an enclosed space is formed above the surface of the sea within the perimeter of said structure, said enclosed space being airtight or nearly airtight, a pontoon located in the moonpool structure and means to support said pontoon above the sea surface when the semi-submersible is in its transit position and to float the pontoon on the sea surface when the semi-submersible is in its operating position.

4,312,288

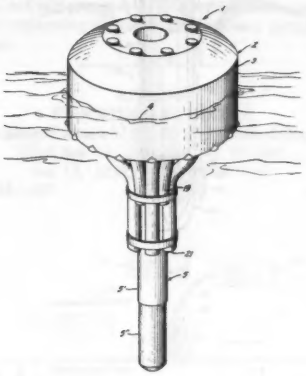
FLOATING STRUCTURE FOR EFFECTING ENERGY TRANSFORMATION FROM SEA WATER

Klemens Finsterwalder, Berg, and Erich Aigner, Munich, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,786

Int. Cl.³ B63B *35/44*; F03G *7/04*

U.S. Cl. 114—264 **18 Claims**



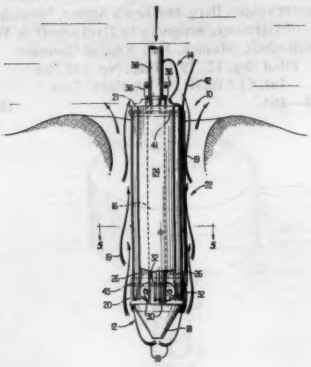
1. Floating structure supported on a body of sea water having a water surface for transforming the thermal energy in warmer sea water located near the water surface into other forms of energy, particularly electrical energy, comprising a floating body, means positioned within said floating body for transforming the thermal energy of the warmer sea water into another form of energy, a tube depending downwardly from said floating body for a considerable depth below the water surface for conveying cooler sea water into said means, wherein the improvement comprises that said floating body is formed of one of reinforced concrete and prestressed concrete and includes a platform forming the upper exterior surface of said floating body and located upwardly from the water surface, said tube is formed of one of reinforced concrete and prestressed concrete and extends substantially vertically downward from said floating body, a bending-resistant connection formed of one of reinforced concrete and prestressed concrete interconnects said tube and said floating body, said floating body including wall means formed of one of reinforced concrete and prestressed concrete with at least one portion of said wall means extending downwardly from said platform to below the water surface and another portion extending transversely of the downward direction above the lower end of said one portion and below said platform so that said portions define a downwardly open annular chamber in said floating body extending inwardly from the inner surface of said one portion of said wall means toward said tube with said chamber being open at the lower end thereof so that water enters into and partially fills said chamber with an air cushion being formed above the water level in the chamber and said portions formed to retain the air cushion, said one portion of said wall means including an annular shaped wall extending downwardly from said platform and defining the laterally outer border of said chamber and said tube having a length downwardly from said bending-resistant connection of at least twice the diameter of said floating body.

4,312,289

PERMANENT MOORING APPARATUS

Joseph Conrad, 3820 Warwick Blvd., Kansas City, Mo. 64111

Filed Nov. 13, 1979, Ser. No. 93,932
Int. Cl.³ B63B *21/28*
U.S. Cl. 114—295 18 Claims



1. A permanent mooring for embedding in a sea bottom, comprising:

a hollow tubular body having a top end and a bottom end,

a plurality of flukes foldably attached to said body and arranged to pivot outwardly from a first position in relation to said body, said plurality of flukes cooperating with one another in the first position to substantially surround said hollow tubular body and to form a substantially closed cylindrical surface,

nozzle means arranged at said bottom end of said body for washing said mooring into the sea bottom,

transmitting means affixed to said body for transmitting a tensional force,

release means releasably holding the plurality of flukes in the first position and responsive to said tensional force from said transmitting means for releasing the plurality of flukes from said first position, and

connection means connecting a high-pressure fluid source to said hollow tubular body for receiving said fluid and transmitting said fluid, via said hollow tubular body, under high pressure to said nozzle means;

wherein, upon placement of said mooring in the sea bottom, said high-pressure fluid source provides fluid under high pressure to said hollow tubular body, said hollow tubular body transmits said fluid to said nozzle means, and said nozzle means expels said fluid under high pressure so as to facilitate embedding of said permanent mooring in the sea bottom; and

wherein, upon application of said tensional force to said permanent mooring, said transmitting means transmits said tensional force to said release means so as to release said plurality of flukes from said first position and permit said plurality of flukes to pivot outwardly;

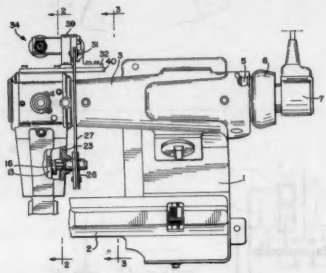
said permanent mooring further comprising stop means associated with said plurality of flukes for preventing said plurality of flukes from pivoting outwardly more than a predetermined distance.

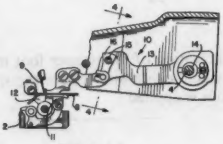
4,312,290

STITCH SHORTENING AND TACKING ASSEMBLY FOR BLINDSTITCH SEWING MACHINES

Wolfgang Norz, Schwieberdingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,657
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923449
Int. Cl.³ D05B *27/22*
U.S. Cl. 112—178 6 Claims





1. In a blindstitch sewing machine having a rotary drive shaft, a reciprocatory needle, a throat plate, means for supporting a workpiece as it passes said needle and a feed mechanism for advancing the workpiece past said needle comprising:

fulcrumed lever means having a feed dog secured to one end thereof for engaging the workpiece and means for converting the rotational movement of the drive shaft into elliptical movement of the feed dog, and

operator controlled eccentric actuating means for transposing the fulcrumed position of said lever means whereby shifting the path of elliptical movement of the feed dog thereby altering the effectiveness of the workpiece advancement.

4,312,291

TOXIC FUME ABSORBER

James V. Knab, 1640 Saginaw SE., Grand Rapids, Mich. 49506

Filed Mar. 14, 1980, Ser. No. 130,587
Int. Cl.³ B05C *15/00*
U.S. Cl. 118—50 9 Claims

1. A toxic fume absorber for a source of toxic fumes generated in a chemical reaction involving a change of state requiring heat, said toxic fume absorber being particularly adapted for use in an environment having a controlled atmosphere, said toxic fume absorber comprising:

an elongate manifold adapted for juxtaposition adjacent the source of the fumes;

an elongate upwardly facing opening to said manifold said opening being disposed adjacent and below the source of the fumes;

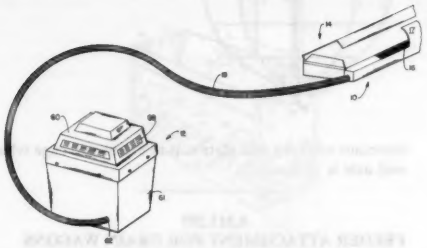
an elongate hood extending from said manifold and at least partially encompassing the source of fumes;

a vacuum source connected to said manifold for drawing the

fumes down from the source of fumes and into the manifold;

filter means for receiving the effluent from said manifold, removing the toxic fumes therefrom and returning the effluent to the controlled atmosphere;

said source of toxic fumes comprising a slide processing stainer, said stainer comprising an elongate body having a plurality of immersion baths for the slides to be processed and an upwardly opening longitudinally extending cover



said cover being hinged to one longitudinally extending side of said stainer, said elongate manifold being adapted for juxtaposition adjacent, parallel and below the opposite longitudinally extending side of said stainer and extending the length of said stainer for drawing toxic fumes from said plurality of immersion baths when said cover is open; and

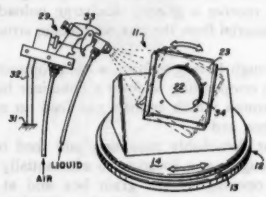
a means for removably mounting said manifold on said opposite longitudinally extending side of said stainer.

4,312,292

SPRAY COATING APPARATUS HAVING A ROTATABLE WORKPIECE HOLDER

Marnell Smith; Victor W. Katvala, both of San Jose, and Ernest E. Porter, Saratoga, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 22, 1978, Ser. No. 945,040
Int. Cl.³ B05C *11/00, 13/02*
U.S. Cl. 118—320 **2 Claims**



1. In a spray coating apparatus for rotating a tile relative to a spray station to obtain a uniform coating of the tile on its front face and side surfaces:

a base plate for disposition on a horizontal reference support plane;

a first turntable supported by and parallel to said base plate and free to rotate in a horizontal plane about a vertical axis of rotation;

a table secured to said first turntable, said table having a major face portion inclined to the horizontal plane;

a second turntable rotatably coupled to said major face portion and free to rotate in a plane parallel to said major face portion about an axis of rotation normal to said major face portion; said second turntable having a number of bores each with a longitudinal axis parallel to said second turntable axis of rotation;

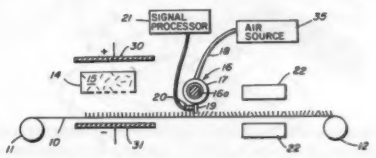
a detachable tile holder adapted to be supported by said second turntable, said tile holder comprising; a plate with first and second opposite faces, said first plate face adapted to support the back face of the tile to be coated, a plurality of erect pins secured to said first plate face and adapted to impale the back face of the tile to be coated, a guard lip extending upwardly from said first face of said plate for shielding the lower portions of the side walls of the tile to be coated, a plurality of dowels secured normal to said second plate face, said dowels being slightly smaller than said second turntable bores and disposed in alignment with said bores so that said dowels may rest within said bores, and said plate having an aperture to receive a pedestal for separating a coated tile from said detachable tile holder.

4,312,293

FLOCKING APPARATUS

Salomon Hakim, Carrera 13, N. 48-26, Bogota, Colombia

Filed Sep. 12, 1980, Ser. No. 186,667
Int. Cl.³ B05C *11/00;* B05B *5/02*
U.S. Cl. 118—697 **15 Claims**



1. Flocking apparatus for producing a pattern of fibers on a backing material comprising:

(1) means for supporting said backing material, said backing material coated on a first side with an adhesive;

(2) means for applying onto said first side of said backing material said fibers oriented substantially perpendicularly to said backing material;

(3) means for generating signals representing said pattern to be reproduced on said flocked material;

(4) an air jet; and

(5) means for controlling said air jet to deflect selectively said fibers away from the perpendicular as a function of said signals representing said pattern.

4,312,294

APPARATUS FOR THERMAL TREATMENT OF SEMICONDUCTORS

Ryozo Satoh, Yamato, Japan, assignor to Tel-Thermco Engineering Co., Ltd., Yokohama, Japan

Filed Mar. 24, 1980, Ser. No. 132,735
Claims priority, application Japan, Mar. 29, 1979, 54-36260
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—733 **6 Claims**

1. In an apparatus for thermal treatment of semiconductors with a treating gas, of a type comprising

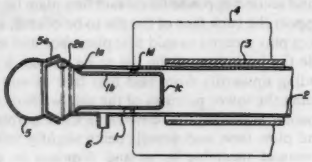
(a) a treating tube, which is adapted to hold semiconductors, which has a fitting flange at one end of the treating tube, which has a tubular wall, and which has an outlet provided in the tubular wall for the treating gas, and

(b) a sealing closure, which has a fitting flange adapted to be interfitted with the fitting flange of the treating tube so as to seal said end, and which is removable from the treating tube so as to open said end,

the improvement wherein the apparatus comprises

(c) a cylindrical plug, which has a closed end, said plug being insertable, closed end first, into the treating tube so

as to extend into the treating tube to substantially fill the treating tube, as far as the closed end of the cylindrical plug, except for a clearance provided around the cylindrical plug, between the cylindrical plug and the treating tube, said clearance preventing ready formation of convection currents in the treating gas.

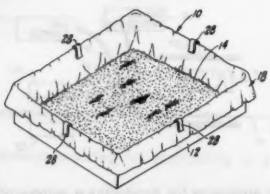


4,312,295

CAT BOX LITTER SCREENING DEVICE

Duane E. Harrington, 365 Crestmont Dr., San Francisco, Calif. 94131

Filed Oct. 1, 1979, Ser. No. 80,547
Int. Cl.³ A01K *29/00*
U.S. Cl. 719—1 20 Claims



1. A cat litter box for extending the useful life of cat litter in a cat litter box by removal of fecal matter therefrom comprising: screening means for screening the cat litter of the fecal matter wherein said screening means comprises at least one sieve sheet having a plurality of holes sized for passage of the litter and retention of fecal matter; and,

means for attaching said sieve sheet to a cat litter box wherein said means for attaching said sieve sheet to a cat litter box comprises a pad having means for attaching said sieve sheet to said pad and means for attaching said pad to the cat litter box.

4,312,296

SEA CAGE FOR FARMING FISH

Yan Stelleman, rue de la Madeleine, 22210 Plemet, and Gerard Jouan, Domaine de Beauregard, 56480 Cleguerec, both of France

Filed Dec. 31, 1979, Ser. No. 108,814
Int. Cl.³ A01K *63/00*
U.S. Cl. 119—3 7 Claims

1. A totally submersable marine cage for breeding fish, set cage comprising:

an axle;

a cage wall structure depending from said axle,

said cage wall structure including a mesh grating forming an enclosure to prevent fish from escaping; at least one float means positioned at each end of said axle;

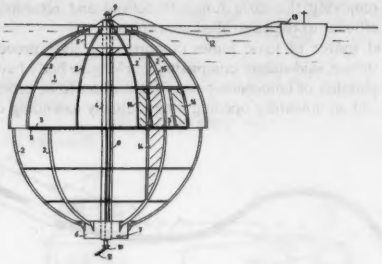
means to fill at least one of said float means with liquid whereby said float means acts as a ballasting device;

said float means including ballasting control means;

said cage rotatable on said axle; and

a plate,

said plate lying in a plane containing said axle and secured within said cage wall structure and extending partially thereinto whereby said plate acts to orient said cage when said axle is vertical.

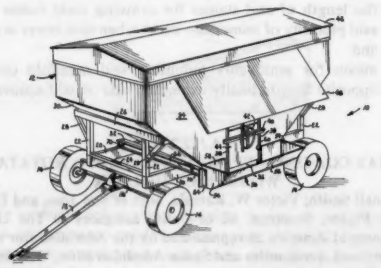


4,312,297

FEEDER ATTACHMENT FOR GRAIN WAGONS

Leland L. Roberts, Rte. 1, Kirksville, Mo. 63501

Filed Jun. 19, 1980, Ser. No. 161,209
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—53 10 Claims



1. A detachable feeder structure for converting a gravity flow grain wagon to a self feeder for animals, said wagon having a grain box with a gravity discharge outlet opening adapted to receive a gravity discharge unloading chute for directing material from the box, said feeder structure comprising:

a feed trough having a front, a back, opposite sides and a bottom cooperating to form a container having an open top through which animals can feed on material in the container; and

means for detachably mounting said feed trough to said grain wagon at a location to substantially underlie said outlet opening of the grain box and at an elevation wherein said open top of the trough is accessible to animals, whereby the feed material in said grain box discharge under the influence of gravity into said container for feeding of the animals, said trough being detachable from said wagon to permit same to function as a gravity flow grain wagon.

4,312,298

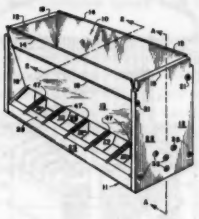
HOG FEEDING DEVICE OF IMPROVED DURABILITY

John D. Swearingin, R.R. 5, Carrollton, Mo. 64633

Filed Mar. 28, 1980, Ser. No. 135,018
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—54 11 Claims

1. A device for the controlled delivery of granular feed material to hogs comprising a multi-compartmented base of

monolithic construction fabricated from concrete, and an upright hopper assembly adapted to interactively engage with said base, said hopper assembly being comprised of two vertically disposed end panels of monolithic construction fabricated from concrete and two rectangular side panels held in opposed downwardly convergent disposition by grooves in said end panels and perpendicular thereto, said base being comprised of a floor portion, two opposed end walls and two opposed side walls, said walls extending upwardly from said floor portion to form a rectangular trough-like cavity, a divider wall extending



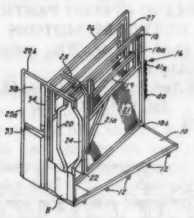
upwardly from said floor portion parallel to said side walls and centered therebetween, and a series of transverse walls extending upwardly from said floor portion in perpendicular disposition between said side walls and divider wall to form compartments within said trough-like cavity disposed on both sides of said divider wall, removable, elongated lower fastening means passing through the end walls of said base and adapted for attachment to said end panels adjacent lower portions thereof, and upper fastening means adapted to interengage said end panels adjacent upper portions thereof while additionally providing abutment support for said side panels of said hopper.

4,312,299

ANIMAL HOLDING CHUTE

Marvin Leiker, R.R. 2, Box 22, Victoria, Kans. 67671

Filed Feb. 1, 1980, Ser. No. 117,578
Int. Cl.³ A01K *1/06*; A61D *3/00*
U.S. Cl. 119—98 **9 Claims**



1. An animal holding chute for simultaneously holding an animal's body and head comprising:

(a) planar base means for supporting a standing animal,

(b) upright frame means inclusive of an open front frame depending upwardly from said base means and having a stationary portion thereof formed into a half of a head holding gate, and a rearwardly extending, open hinged gate frame depending from said open front frame and secured to an upright at the rear of said base means, and a pivot holding frame member extending from said open front frame to said hinged gate frame,

(c) a first gate hinged to said rear upright and angularly, adjustably held on said front frame,

(d) a second gate secured by a pivotal attachment adjacent to and spaced from its front end on said pivot holding frame member and on said base, the front portion of said second gate formed into a moving portion of the other half of said head holding gate and the rear portion formed as a body holding gate against said hinged gate, said pivot attachment arranged to provide scissor action for conjoint closing and opening of both said head and body gates and

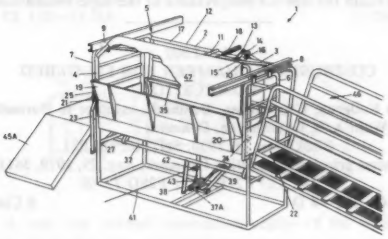
(e) adjustable holding means for temporarily securing said second gate.

4,312,300

SHEEP HANDLING APPARATUS AND METHODS OF HANDLING SHEEP

Donald L. Hopkins, Victoria, Australia, assignor to Alf Hannaford & Co. Pty. Ltd., Beverley, Australia

Filed Mar. 6, 1980, Ser. No. 127,758
Claims priority, application Australia, Mar. 7, 1979, PD7943
Int. Cl.³ A61D *3/00*; A01K *15/00*
U.S. Cl. 119—98 **7 Claims**



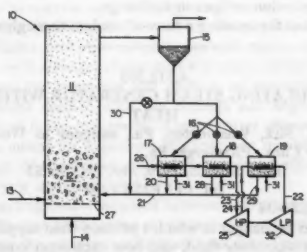
1. An arrangement for assisting handling of sheep characterised by including a pen having two sides oppositely positioned to define a chute, a gate positioned at each end of the chute and adapted to close the pen at its ends, each gate positioned and adapted with the chute so that a sheep entering the chute from an inlet end and entering past a first of the said gates can discern an open status of the gate relative to the pen at the other end of the chute, detection and closure means within the pen adapted to detect the presence of a sheep within the pen and adapted to close both said gates upon such detection, said detection and closure means including a floor pad depressable by a sheep entering the pen to actuate gate closing means, and a first of the said two sides having withdrawal means adapted to permit a sheep to be selectively moved through the said side to effect withdrawal of the sheep from the pen.

4,312,301

CONTROLLING STEAM TEMPERATURE TO TURBINES

Donald Anson, Worthington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 18, 1980, Ser. No. 113,246
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **15 Claims**



1. A method for generating steam in a steam generator and

superheating the steam in a superheater to a desired temperature independent of steam flow rate comprising

(A) generating heat from the combustion of fuel in an entrained bed combustor having relatively fine particles entrained in a fluidizing gas,

(B) transferring heat of combustion of the fuel to the fine, entrained bed particles in the combustor,

(C) directing a selected first portion of the heated, fine entrained bed particles through and in contact with the steam generator such that heat is given up by the fine entrained bed particles to generate steam,

(D) directing a selected second portion of the heated, fine entrained bed particles through and in contact with the superheater such that heat is given up by the fine entrained bed particles to superheat the steam, and

(E) adjusting the amount of heat generated in the combustor and the relative amounts of first and second portions directed through the steam generator and superheater to obtain the desired temperature of the superheated steam.

4,312,302

COMBUSTION CHAMBER FOR FLUID-BED COMBUSTION

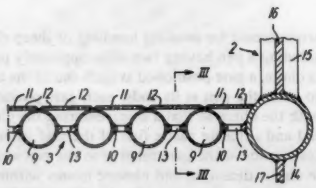
Vagn Kollerup, Copenhagen, Denmark, assignor to Burmeister & Wain A/S, Copenhagen, Denmark

Filed Mar. 31, 1980, Ser. No. 136,051

Claims priority, application Denmark, Aug. 29, 1979, 3611/79

Int. Cl.³ F22B *1/00*; F28D *13/00*

U.S. Cl. 122—4 D **6 Claims**



1. A combustion chamber for a fluidizing bed type boiler, comprising side walls and a composite bottom wall for supporting a fluidized bed in which the combustion takes place;

said bottom wall including a membrane wall composed of horizontally spaced tubes and intermediate fins each bridging the spacing between two adjacent tubes and welded to said tubes, and a plurality of sheet metal strips located above said membrane wall with one strip spaced vertically from each of said fins and welded to the same tubes as that fin, each of said strips having a plurality of longitudinally spaced air injection orifices extending vertically therethrough;

means for introducing fluidizing and combustion air to the spaces between said fins and strips comprising apertures in said fins having a total area greater than the total area of the injection orifices in said strips,

and means for creating a flow of coolant through said tubes.

4,312,303

RECIRCULATING STEAM GENERATOR WITH SUPER HEAT

Francis J. Sisk, Washington, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 25, 1979, Ser. No. 78,752

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—34 **9 Claims**

1. A heat exchanger in which a primary fluid supplies heat to vaporize a secondary fluid, said heat exchanger comprising:

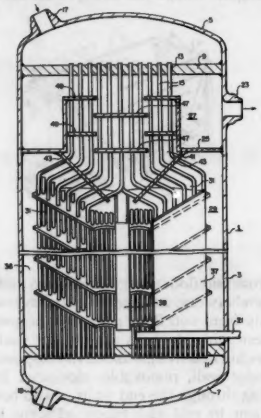
a vertically oriented shell with a secondary fluid inlet and outlet,

a plurality of tubes generally disposed vertically in said shell, said tubes being disposed in clusters with open lanes between adjacent clusters,

said primary fluid flowing in a downward direction through said tubes,

a transverse baffle dividing said shell into an upper superheating portion and a lower vaporizing portion,

a plurality of baffles disposed in the superheating portion to



cause said secondary fluid to follow a sinuous path over the outer side of said tubes,

a plurality of tilted baffles disposed in said vaporizing porton of said shell, said tilted baffles being inclined upwardly, and

return means for recirculating unvaporized secondary fluid from the upper to the lower end of said tilted baffles whereby said vaporizing portion operates in recirculating mode.

4,312,304

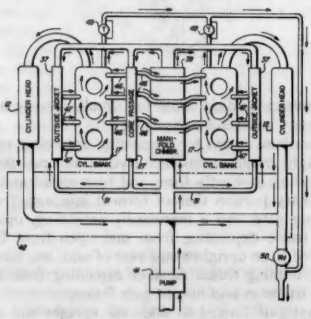
V-ENGINE COOLING SYSTEM PARTICULARLY FOR OUTBOARD MOTORS

Alfred E. Tyner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 6, 1979, Ser. No. 64,119

Int. Cl.³ F01P *3/02*

U.S. Cl. 123—41.74 **8 Claims**



3. A water cooled, two-cycle, crankcase compression outboard motor engine comprising:

A. a cylinder block having cylinder bores arranged in two banks, said banks angularly oriented in a V-arrangement,

with a transfer passage for each cylinder, said transfer passage including transfer ports for admitting air-fuel mixture to said cylinders;

B. a crankcase attached to the ends of said cylinder banks near the apex of said V, said crankcase having a plurality of crankcase compartments, each in communication with one of said transfer passages;

C. two cylinder heads secured respectively to the end of each of said cylinder banks opposite said crankcase;

D. an exhaust gas manifold between said cylinder banks;

E. a central core cooling chamber having common walls with each of said cylinder banks and said exhaust gas manifold;

F. a pair of outside cooling jackets, each one disposed on the outside of one of said cylinder banks opposite said central core cooling chamber, said outside cooling jackets positioned near the crankcase end of said cylinders with a transfer passage positioned between each of said cylinders and the corresponding outside cooling jacket;

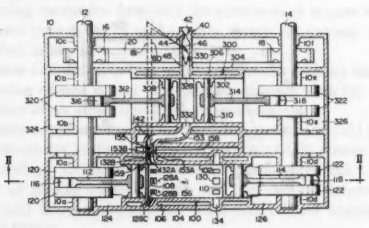
G. coolant supply means to supply coolant directly to each of said outside cooling jackets and said central cooling chamber.

4,312,305

TWO-STROKE CYCLE GASOLINE ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 13, 1979, Ser. No. 57,495
Claims priority, application Japan, Sep. 18, 1978, 53-114224
Int. Cl.³ F02B *25/08*
U.S. Cl. 123—51 BA **5 Claims**



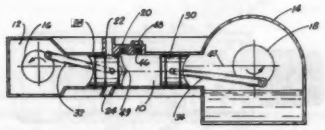
1. A two-stroke cycle gasoline engine, comprising: a throttle valve; at least one two-stroke cycle uniflow scavenging power cylinder-piston assembly which has a power cylinder, two horizontally opposed power pistons, and a scavenging port configuration consisting of first, second, and third scavenging port configurations each having an axis of opening along which fuel-air mixture is discharged and provided in the wall of the power cylinder so as to be successively uncovered in the specified order by one said power piston as it moves from its top dead center to its bottom dead center; said first scavenging port configuration having a substantially smaller opening area than said second and third scavenging port configurations; the axes of said first and second scavenging port configurations being substantially more inclined relative to the radius of said power cylinder than is the axis of said third scavenging port configuration so that said first and second scavenging port configurations give substantially stronger swirl to fuel-air mixture discharged therefrom than the amount of swirl, including zero swirl at its lower extremity, given by said third scavenging port configuration to fuel-air mixture discharged therefrom; a scavenging pump device including at least one pump cylinder-piston assembly of the reciprocating type driven by said power cylinder-piston assembly in synchronization therewith; a first passage which conducts fuel-air mixture from said scavenging pump device to said first and second scavenging port configurations; a second passage which conducts fuel-air mixture from said scavenging pump device to said third scavenging port configuration; and a control valve which is operationally related with said throttle valve and which substantially throttles said first passage only when the engine is operating at relatively low load in a predetermined load range, which excludes very low load including idling and medium to high load having a delivery ratio at least at a predetermined value.

4,312,306

FLEXIBLE CYLINDER-HEAD INTERNAL COMBUSTION ENGINE

Benjamin Bundrick, Jr., Rte. 3, Box 272, Slidell, La. 70458

Filed Jul. 31, 1979, Ser. No. 62,581
Int. Cl.³ F01B *17/02;* **F02D** *35/02;* **F02B** *25/08*
U.S. Cl. 123—51 BA **3 Claims**



1. A two cyle internal combustion engine of the variable compression ratio type, comprising:

(a) cylinder means with opposed piston means reciprocally mounted therein for defining combustion chamber means therein and between at opposing top dead centers of said piston means;

(b) air, fuel, and exhaust port means defined in said cylinder means, and closer to one end than to another, for control of all said port means by said piston means mounted in said port defining cylinder means part;

(c) unequal crank throws respectively mounted adjacent oppositely disposed ends of said cylinder means on respective centers of rotation similar and equally offset from said cylinder means center axis, with the shorter throw crank means mounted adjacent said port means-defining part of said cylinder means, for eliminating the coincidence of respective piston and crank means' top and bottom dead centers, and for decreasing the angular displacement of said crank means on one side of said cylinder means center axis and increasing it on the other side;

(d) unequal connecting rod means pivotally connecting said piston means with said offset crank means, the shorter of said connecting rod means connecting said shorter throw crank means to said piston means in said port means-defining cylinder part for controlling all said port means thereby, and said piston and crank means being connected in relative positions for a short connecting rod piston means to operate as a valve opening and closing mechanism that provides it own power of operation and also contributes to the overall power of said engine, and cooperates with a longer connecting rod piston means in coordinating the beinnings and endings of maximum linear movement thereof with the endings and beginnings of minimum linear movement of said shorter connecting rod piston means for maximum efficiency im mechanical advantage of the power cycle and in valving efficiency of two cycle operation, and

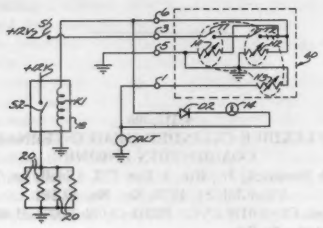
(e) connecting means mounted between said crank means for each to turn at the same revolutions per minute, and for varying the relative positions of said piston means in the respective cylinder means for changing compression ratio in said combustion chamber.

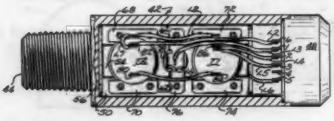
4,312,307

GLOW PLUG DUTY CYCLE MODULATING APPARATUS

Lawrence E. Cooper, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 4, 1980, Ser. No. 118,286
Int. Cl.³ F02N 17/00, 11/00; H05B 1/12
U.S. Cl. 123—145 A 6 Claims





1. Apparatus for providing a thermal analog of diesel engine glow plugs and to modulate the duty cycle of power supplied to such glow plugs comprising

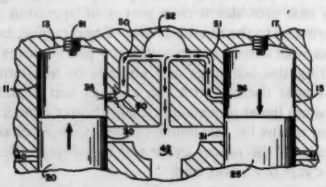
a housing, first and second ceramic like heater elements disposed in the housing, a heat sensitive, normally closed switch mounted on top of each of the first and second heater elements in thermally coupled relation with each respective heater element, heat sink means thermally coupled to both the first and second heater elements, means to connect the switches in series circuit relation and connectable to means controlling the energization of the glow plugs and to an ignition switch, one of the two switches modulating the current flow to the glow plugs, the other of the two switches as a back up protector, means to electrically energize the first and second heater elements only when current is passing through both heat sensitive switches, and means to interrupt current flow to the glow plugs upon the occurrence of a preselected condition.

4,312,308

COMPRESSION RELIEF SYSTEM FOR INTERNAL COMBUSTION ENGINE

Gordon C. Slattery, 6435 Springbrook Rd., Omro, Wis. 54963

Filed Feb. 21, 1980, Ser. No. 123,331
Int. Cl.³ F02B 75/06
U.S. Cl. 123—182 16 Claims



1. A two-cycle internal combustion engine comprising:

(A) at least one pair of cylinders, said cylinders being closed at one end;

(B) a piston mounted for reciprocation in each of said cylinders;

(C) at least one exhaust port in each of said cylinders;

(D) a compression relief means to relieve compression in each of said cylinders during the compression stroke of the corresponding one of said pistons; and

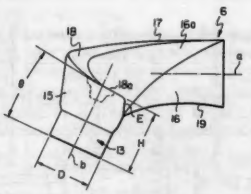
(E) a means using exhaust pressure from one cylinder to prevent said compression relief means from operating on the other cylinder at relatively high engine speeds.

4,312,309

HELICALLY-SHAPED INTAKE PORT OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi, and Takeshi Okumura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 17, 1979, Ser. No. 40,046
Claims priority, application Japan, Sep. 25, 1978, 53-116664
Int. Cl.³ F01L 3/00
U.S. Cl. 123—188 M 12 Claims



1. A helically-shaped intake port of a spark-ignition internal combustion engine, which comprises: a helical portion having an open outlet end face; an intake valve arranged at said outlet end face, said helical portion being defined by an upper wall, an inner wall and a peripheral outer side wall which extends circumferentially about an axis of said intake valve; an inlet passage portion; a connecting portion tangentially connecting said inlet passage portion to said helical portion and having an open inlet end, said inlet passage portion being defined by an upper wall, a bottom wall, a first side wall arranged at a position near the axis of said intake valve, and having an inclined wall portion inclined in a direction such that the width of said inlet passage portion above the lower edge of the inclined wall portion at any point along said inlet passage portion is narrower than the width of said inlet passage portion below said inclined wall portion at said point and a second side wall arranged at a position remote from the axis of said intake valve and connected to the peripheral outer side wall of said helical portion; and a helix terminating portion, the upper wall of said helical portion extending to said helix terminating portion from the connecting portion, the height between said open outlet end face and the end portion of the upper wall of said helical portion, which is located at said helix terminating portion, being at least approximately as large as the diameter of said outlet end, the angle between the outlet end face and the end portion of the upper wall of said helical portion being less than about 20°.

4,312,310

POLLUTION-PREVENTING AND DRIVING DEVICE FOR INTERNAL COMBUSTION ENGINES

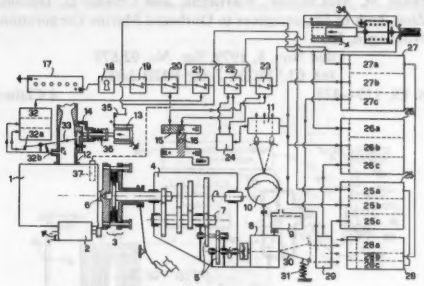
Fausto Chivilo', Barlassina, and Francesco Sezzi, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Apr. 17, 1979, Ser. No. 30,926

Claims priority, application Italy, Apr. 24, 1978, 22646 A/78; Apr. 24, 1978, 22647 A/78

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—198 DB **7 Claims**



6. A pollution-preventing and power-recovery device for an internal combustion engine, said engine being coupled by a transmission to a load, said device comprising:

means separate from said engine, for applying power to said engine;

sensing means for detecting the condition of engine idling;

means connected to said sensing means for cutting off the fuel intake to said engine;

means connected to said sensing means for causing the actuation of said power means in accordance with the detection of an idling condition of said engine;

means coupled between said sensing means and said power means for locking out said actuation of said power means during a shifting of gears in said transmission, and wherein said sensing means permits said fuel cutt-off means to be reset upon a normal run condition of said engine; and wherein

said power means comprises a fluid actuated pump, a pressure accumulator for a working fluid of said pump, and a mechanical coupling means for disconnectably connecting said pump to said engine.

4,312,311

ENGINE IDLING CORRECTION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Hiroyoshi Iwata, Yachiyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 2, 1980, Ser. No. 145,988

Claims priority, application Japan, May 2, 1979, 54-59297[U]

Int. Cl.³ F02M *3/00*

U.S. Cl. 123—339 **5 Claims**

1. In an engine idling correcting system for an automotive vehicle including an air conditioner and an automatic transmission, an actuator which comprises:

(a) a housing;

(b) an operating shaft disposed within said housing;

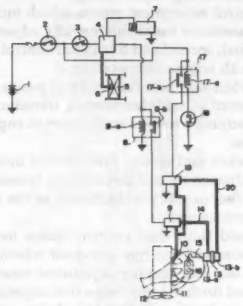
(c) a first diagram disposed within said housing and fixed to said operating shaft;

(d) a second diaphragm disposed within said housing so as to form a first vacuum compartment between said first and second diaphragms and a second vacuum compartment between said second diaphragm and a portion of said housing;

(e) a slidable collar fitted over said operating shaft and fixed to said second diaphragm;

(f) a locking washer provided on said operating shaft with which said slidable collar may engage to move said shaft;

(g) first switching means for selectively introducing a vacuum into the first vacuum compartment in response to a first parameter of the engine operating conditions; and



(h) second switching means for selectively introducing a vacuum into the second vacuum compartment in response to a second parameter of the engine operating conditions, whereby if either switching means is activated to admit a vacuum, said operating shaft is moved.

4,312,312

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

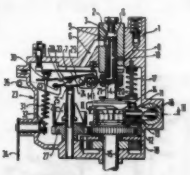
Gerald Höfer, Weissach-Flacht; Manfred Schwarz, Gerlingen, and Karl Konrath, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,249

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1978, 2844910

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—340 **18 Claims**



1. In a fuel injection pump for internal combustion engine, which includes:

a pump housing;

at least one pump piston;

a cam drive means for effecting a fuel delivery movement of said at least one pump piston, said cam drive means including a revolving first part and a second part which is supported in said pump housing and which is rotatable within said housing about said revolving first part along a predetermined arcuate path, the position of said second part determining onset of fuel injection;

a first final control means for controlling onset of fuel injection, which includes said second part of said cam drive means;

a fuel supply quantity adjustment means for determining the quantity of fuel injection;

an adjustment lever coupled to arbitrarily actuate said fuel

supply quantity adjustment means, which is arbitrarily movable along a predetermined path from a rest or idling position to increase the quantity of fuel injected; and

an rpm governor means for actuating said fuel supply adjustment means, which includes

a second final control means for controlling fuel quantity injected during engine starting, and

a third final control means for controlling fuel quantity injected during engine idling;

a final control adjustment means which includes a thermostatic transducer for simultaneously adjusting at least two of said first, second and third final control means in accordance with engine temperature;

wherein when said first final control means is connected to and adjusted by said thermostatic transducer, the injection onset is adjusted toward early onset as engine temperature decreases;

wherein, when said second final control means is connected to and adjusted by said thermostatic transducer means, the starting fuel quantity is decreased as the engine temperature increases; and

wherein, said third final control means includes an idling spring means of said rpm governor which is connected to position said fuel quantity adjustment means during engine idling; and further comprises a first adjustable stop for said adjustment lever, said first stop being connected to said thermostatic transducer which determines the position of said stop, the position of said stop determining the idling position of said adjustment lever by limiting the path of travel in one direction of said adjustment lever; and

wherein, said thermostatic transducer is coupled to said idling spring means to adjust said third final control means by varying prestressing of said idling spring during engine idling such that the fuel quantity at engine idling is decreased as engine temperature increases.

4,312,313

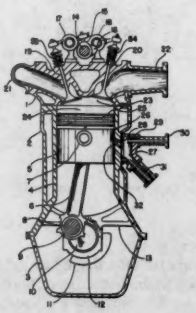
ENGINE VERTICAL VENTILLATION

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Continuation-in-part of Ser. No. 956,666, Nov. 1, 1978, abandoned, and a continuation-in-part of Ser. No. 102,910, Dec. 12, 1979, Pat. No. 4,248,199. This application Jun. 5, 1980, Ser. No. 156,573

Int. Cl.³ F02B *15/00, 75/02;* **F02M** *25/06*

U.S. Cl. 123—433 **12 Claims**



1. A cylinder of an internal combustion engine having a plurality of such cylinders, a piston slidably mounted in said cylinder moving translationally in an up and down reciprocating motion, an air-receiver fixedly attached to said cylinder, a side-port in said cylinder, said side-port placing said cylinder internal volume above said piston in communication with the internal volume of said air-receiver when the said piston is near the bottom of its stroke in said cylinder, a diffuser fixedly attached to said air-receiver at a point opposite and axially aligned with the axial center of said side-port, said diffuser opening into an exhaust duct, a plurality of lower side-ports positioned below said side-port, said lower side-ports placing the internal volume of said cylinder in communication with the internal volume of said air-receiver when the said piston is at the bottom of its stroke, an air duct opening into said air-receiver.

4,312,314

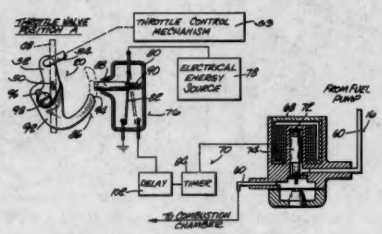
ACCELERATION FUEL ENRICHMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Richard M. McChesney, Wavilegan, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 8, 1979, Ser. No. 92,575

Int. Cl.³ F02M *7/00;* **F02B** *3/00*

U.S. Cl. 123—438 **4 Claims**



1. An engine operable between a low speed and a range of speeds above the low speed, said engine comprising a combustion chamber, throttle means operatively connected with said engine for movement between a low speed position for operating said engine at the low speed and a range of positions spaced from said low speed position for operating said engine within the range of speeds above the low speed, and fuel delivery means communicating with said combustion chamber and adapted for connection with a fuel source, said fuel delivery means being operative for introducing fuel from the fuel source into said combustion chamber and including means connected with said throttle means for operating said fuel delivery means in response to advancment of said throttle means from said low speed position to introduce fuel from the fuel source into said combustion chamber for a predetermined time interval, first delay means for preventing a second initiation of said fuel delivery means in response to a second advancement of said throttle means from said low speed position until after the expiration of said predetermined time interval, and second delay means operative for preventing a second initiation of said fuel delivery means in reponse to a second advancement of said throttle means from said low speed position until after said throttle means has been retained in said low speed position for a predetermined period of time, regardless of the expiration of said predetermined time interval.

4,312,315

SYSTEM FOR DIGITAL CONTROL OF OPERATION OF INTERNAL COMBUSTION ENGINE

Sadao Takase, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 15, 1980, Ser. No. 140,664

Claims priority, application Japan, Apr. 16, 1979, 54-45325

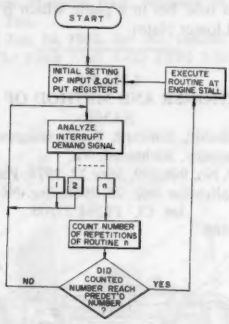
Int. Cl.³ F02B *77/00*

U.S. Cl. 123—479 **5 Claims**

1. In a system to control the operation of an internal combustion engine, the system having sensor means for producing electrical signals respectively representing parameters of operating conditions of the engine and a digital control means for repeatedly executing computing processing by utilizing said

electrical signals as input information thereby producing a control signal to control the operation of at least one actuator which can regulate a factor of operation of the engine, the sensor means including means for producing a pulse signal representative of the rotational speed of the engine,

the improvement comprising: said digital control means including comparing means for comparing pulse intervals between two successive pulses of said pulse signal with a predetermined length of time, and discriminating means for forming a judgement that the engine is stalling when said pulse intervals continue to be equal to or longer than said predetermined length of time for another predetermined length of time; said comparing means comprising:



first means for storing a reference signal which implies said predetermined length of time; second means for detecting the time length of each of said pulse intervals; and third means for generating a pulse each time the time length of any one of said pulse intervals corresponds to said predetermined length of time implied by said reference signal; said discriminating means comprising means for examining whether the generation of said pulse by said third means of said comparing means is repeated a predetermined number of times during said another predetermined length of time.

4,312,316

FUEL INJECTION PUMPING APPARATUS

Alec H. Seilly, North Wembley, and Dorian F. Mowbray, Burnham, both of England, assignors to Lucas Industries Limited, Birmingham, England

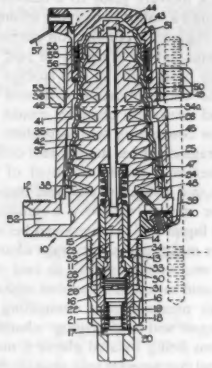
Filed Nov. 16, 1979, Ser. No. 94,908

Claims priority, application United Kingdom, Apr. 7, 1979, 12311/79

Int. Cl.³ F04B *17/04*

U.S. Cl. 123—499 **10 Claims**

1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising an injection nozzle through which fuel can flow and an injection pump for delivering fuel to the nozzle, the apparatus including a housing defining a boss portion, a fuel injection nozzle secured to said boss portion, a hollow pump barrel defining a cylindrical bore located within the housing, said pump barrel having a peripheral flange at one end for engagement with a step defined in the housing, a hollow cylindrical member engaging with the side of said flange remote from the step, a flanged nozzle assembly engaged with said hollow cylindrical member and a cap nut engaged with said nozzle assembly and in screw thread engagement with the boss portion of the housing, the nozzle communicating with one end of said bore, a pumping plunger located within said bore, resilient means biasing the pumping plunger away from said one end of the bore, a solenoid core member mounted on the housing, the core member having its axis co-axial with the axis of movement of the pumping plunger, a bore extending axially through the core member, an armature surrounding the core member, a push-rod extending through said axial bore to operatively connect the armature with said plunger, a cover surrounding said armature and defining surfaces to support the armature for axial movement, a fuel inlet into the chamber defined within the cover, grooves formed in the bore member whereby the core member defines circumferentially extending ribs, windings in said grooves and arranged so that when electric current is passed therethrough



the ribs will assume opposite magnetic polarity, surfaces on said armature corresponding with said ribs whereby when the windings are energized the armature will effect movement of the pumping plunger towards said one end of the bore to displace fuel from the bore to the nozzle and a non-return valve through which fuel can flow into said bore during the return stroke of the plunger under the action of said resilient means.

4,312,317

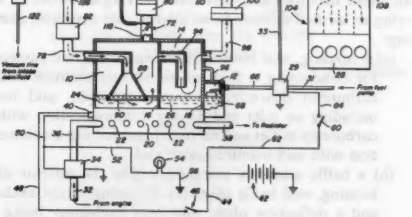
CARBURETOR

Bryce D. Jewett; Robert H. Raynor, and Robert P. Adams, all of Richmond, Va., assignors to Bryce D. Jewett Machine Manufacturing Company, Inc., Richmond, Va.

Filed Oct. 19, 1979, Ser. No. 86,576

Int. Cl.³ F02M *31/00, 13/04*

U.S. Cl. 123—522 **12 Claims**



1. A carburetor system for a liquid fuel internal combustion engine cooled by a circulating liquid coolant, said system comprising:

saturation chamber means having a supply of said liquid fuel contained therein;

air intake means fluidly connected to said saturation chamber means and being operable to direct a supply of air through said liquid fuel contained in said saturation chamber means so as to create a fuel and air vapor mixture for

delivery to said internal combustion engine for combustion purposes;

heat exchange means operably connected to said saturation chamber means and serving to heat said liquid fuel contained in said saturation chamber means so as to compensate for heat loss during a vaporization of said liquid fuel contained in said saturation chamber means; and

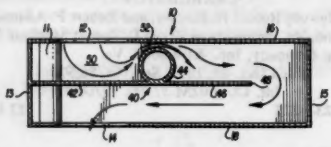
storage chamber means for receiving and storing said fuel and air vapor mixture prior to a delivery of said vapor mixture through a vapor conveying means to said internal combustion engine for combustion purposes, said storage chamber means having a supply of said liquid fuel contained therein, said liquid in said storage chamber means being in fluid communication with said liquid fuel contained in said saturation chamber means by means of an orifice means connecting said saturation chamber means and said storage chamber means, said orifice means being positioned below a mimimum level of said liquid fuel contained in said saturation chamber means and said storage chamber means, whereby a substantially constant level of said liquid fuel is maintained between said saturation chamber means and said storage chamber means, said delivery of said vapor mixture to said storage chamber means from said saturation chamber means being effected by a conduit means fluidly connecting said saturation chamber means and said storage chamber means, said conduit means being located above a maximum level of said liquid fuel contained in said saturation chamber means and said storage chamber means.

4,312,318

COMBUSTION ENGINE FUEL ECONOMIZER

Ken W. Davis, Lyford, and Leo B. McCay, LaFeria, both of Tex., assignors to Martin P. Ferrero, Trustee; Robert L. Hensz; Martin P. Ferrero, all of Harlingen, Tex. and J. Gibson Semmes, Washington, D.C.

Filed Apr. 21, 1980, Ser. No. 142,125
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—546 **8 Claims**



1. A fuel economizing and pollution reducing device for an internal combustion engine of the type having a carburetor and an intake manifold, said carburetor having an outlet for delivering an air-fuel mixture to an inlet of said manifold, comprising:

(a) a housing, said housing defining an internal passageway for conducting a flow of an air-fuel mixture from the carburetor downstream to the manifold, said housing including an inlet end having communication with said carburetor outlet and an outlet end having a communication with said manifold inlet; and

(b) a baffle assembly disposed within the interior of said housing, said baffle assembly including a heat exchanger and a deflection plate, said heat exchanger being positioned to provide a constriction of the internal passageway of said housing downstream of said carburetor, said deflection plate being positioned contiguous to said heat exchanger to direct the flow of the air-fuel mixture through said constriction, said heat exchanger being heated by the circulation therethrough of hot exhaust gases from said engine; and

(c) wherein said heat exchanger comprises a hollow cylindrical tube, said tube extending through said housing and generally transverse to the flow of fuel-air mixture through said internal passageway; and

(d) wherein said inlet end defines a flat upper plate and said outlet end defines a flat lower plate, said upper plate and said lower plate being disposed in parallel spaced relation, and wherein said constriction of the internal passageway is provided between said cylindrical tube and said upper plate; and

(e) wherein said baffle assembly includes a mixing plate, said mixing plate being disposed downstream of said constriction; and

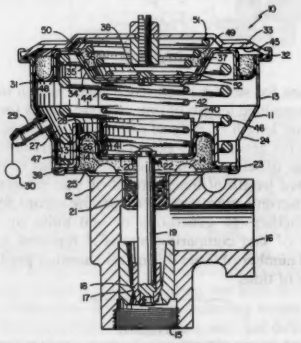
(f) wherein said deflection plate and said mixing plate are each disposed in parallel spaced relation to said upper and lower plates, and wherein the longitudinal axis of said cylindrical tube lies in a plane which is parallel to said upper and lower plates.

4,312,319

VALVE POSITIONER AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 908,209, May 22, 1978, Pat. No. 4,239,181.
This application Aug. 25, 1980, Ser. No. 180,644
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **2 Claims**



1. In a self-contained valve positioner having a single valve positioner housing including an actuator portion and having a pneumatically operated actuator means therein carrying a main valve member to position said main valve member relative to a main valve seat in a valve unit in relation to the magnitude of a single pneumatic signal directed to said valve positioner and being utilized as the fluid source therein for pneumatically operating said actuator means, said actuator means having means in said housing to cause said actuator means to progressively open said valve member as said signal being directed to said valve positioner progressively increases from a first value to a second value and thereafter to progressively close said valve member as said signal being directed to said valve positioner progressively increases from said second value to a third value, said actuator means including a first flexible diaphragm operatively interconnected to said main valve member and being movable in relation to the pressure differential acting across the same, said means of said actuator means comprising a second flexible diaphragm not operatively interconnected to said main valve member, said first diaphragm and said second diaphragm being spaced from each other and defining a chamber therebetween that receives said pneumatic signal therein, a first compression spring disposed in said chamber and having opposed ends respectively acting on said first diaphragm and said second diaphragm, the improvement comprising a second compression spring disposed in said chamber and having opposed ends, one of said ends of said second spring bearing

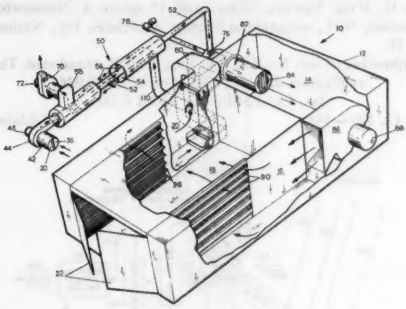
against said housing and the other of said ends of said second spring acting on a retaining means on said second diaphragm such that said second diaphragm is moved towards said valve member against the bias of both said first and second compression springs as said signal increases from said second value to said third value, said valve member and said valve seat comprising an exhaust gas recirculation means of an internal combustion engine and said pneumatic signal comprising a vacuum signal directed from the vacuum manifold of said engine whereby said actuator means is vacuum operated.

4,312,320

INCINERATOR APPARATUS AND METHOD

Charles E. Jennings, Houston, Tex., assignor to PA Incorporated, Houston, Tex.

Filed Jun. 16, 1980, Ser. No. 160,037
Int. Cl.[3] F24B 5/00, 7/00; F23G 5/04
U.S. Cl. 126—79 13 Claims



1. An incinerator apparatus comprising, in combination: an inlet duct having at least two independently positionable damper means for controlling the flow of air through said inlet duct; an outlet duct having at least two independently positionable damper means for controlling the flow of air through said outlet duct; heat exchanger means for transferring heat from such air passing through said outlet duct to such air passing through said inlet duct; combustion means in communication with said inlet duct for heating such air in said inlet duct; a treatment chamber in communication with said combustion means, said treatment chamber having a plurality of outlet louvers for directing such air exiting said treatment chamber in a downward direction; a bifurcated recirculation means defining an upper and lower inlet in communication with said treatment chamber for recirculating a portion of such air exiting said treatment chamber to said combustion means; and inlet means in communication with said outlet duct for receiving the remaining portion of such air exiting said treatment chamber.

4,312,321

HEAT EXCHANGER CONSTRUCTION FOR SOLID FUEL BURNING FURNACE

Lynn R. Skow, North Branch, Minn., assignor to Gemini Systems, Inc., North Branch, Minn.

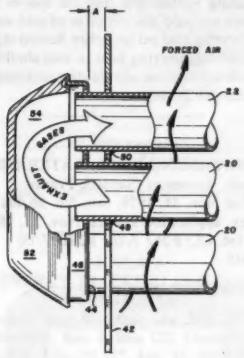
Filed Apr. 7, 1980, Ser. No. 137,852
Int. Cl.[3] F24H 3/00
U.S. Cl. 126—99 A 5 Claims

1. A heat exchanger for a furnace system, comprising:

(a) a first manifold member having a box-like enclosure with baffle means contained therein for dividing said box-like enclosure into a plurality of chambers, said enclosure having a generally open side wall for allowing noxious gases to enter therein and into one or more of said chambers, a rear plate having a plurality of apertures formed therethrough, each of said chambers having at least one of said apertures communicating therewith, and a front plate with an aperture communicating with only one of said plurality of chambers;

(b) a support plate having a plurality of apertures formed therethrough in a pattern corresponding to the pattern of said plurality of apertures formed in said rear plate of said first manifold member;

(c) a plurality of elongated tubular members extending between said rear plate and said support plate and maintained in a parallel and spaced apart orientation with respect to one another, said tubular members each having their opposed ends extending through aligned pairs of said apertures in said rear plate and said support plate with a predetermined tolerance between said tubular members and said support plate, said tubular members being fastened to at least said support plate by a tack weld with the ends of said tubes extending beyond a front surface of said support plate by a predetermined distance; and



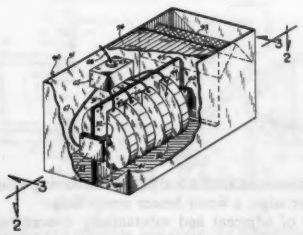
(d) a second manifold member having a box-like enclosure comprised of an end plate and four integrally formed side walls extending perpendicularly to said end plate, said end plate having a pattern of apertures corresponding to said pattern of apertures on said support plate, said second manifold member being mounted on said ends of said tubes extending beyond said front surface of said support plate with a predetermined spacing between said end plate of said second manifold member and said front surface of said support plate said apertures of said end plate and said tubes also having a predetermined tolerance therebetween.

4,312,322

DISCED FRICTION HEATER

Robert P. Freihage, Box 416, Afton, Iowa 50830

Filed Apr. 14, 1980, Ser. No. 140,168
Int. Cl.[3] F24C 9/00
U.S. Cl. 126—247 15 Claims



1. A heating device having a power source, comprising:

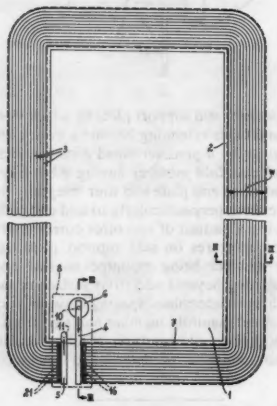
(a) a drive member rotated by said power source;
(b) a plurality of discs secured to said drive member; said discs being rotated by said drive member;
(c) a shell member enclosing said discs, said shell member having a base member and a plurality of disc sections disposed substantially normally from said base member, each of said disc sections enclosing a portion of one of said discs, said disc sections being adjacently spaced along said base member to define an air space between each adjacent pair of disc sections, said shell member being stationary and each of said disc sections having an interior surface and an exterior surface, said shell member providing for disc oil spaces between said interior surfaces of said disc sections and said discs; and
(d) oil circulating within said disc oil spaces between said rotating discs and said disc sections of said stationary shell member whereby said oil becomes heated due to friction, said heated oil transferring heat to said shell member such that said exterior surface of said disc sections of said shell member becomes heated.

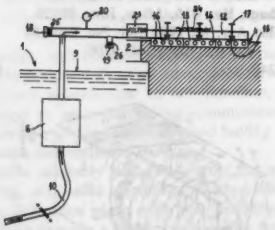
4,312,323

SOLAR SWIMMING-POOL WATER HEATER

Michel Domenech, Apremont (Savoie), France

Filed Nov. 21, 1979, Ser. No. 96,496
Claims priority, application France, Nov. 23, 1978, 78 33639
Int. Cl.³ F24J *3/02*; F28D *7/06*
U.S. Cl. 126—415 **9 Claims**





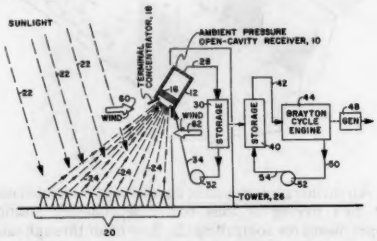
1. In combination with a body of water having a liquid level and an outer edge, a water heater comprising:
an array of adjacent and substantially concentric annular flexible synthetic-resin tubes surrounding said body at said edge and having a rectified length equal to at least 30 times its horizontal cross-sectional width, said tubes lying horizontally and laterally against one another and having exposed upper surfaces and respective and adjacent feed and return ends;
a feed manifold connected to all of said feed ends;
a return manifold connected to all of said return ends, whereby said tubes are connected in parallel between said manifolds;
respective feed and return conduits connected to said feed and return manifolds and both opening into said body of water below said liquid level thereof; and
means including a pump in one of said conduits for drawing water from said body in through said feed conduit, for passing the water sequentially through said feed manifold, tubes, return manifold, and return conduit, and for expelling the water into said body from said return conduit.

4,312,324

WIND LOSS PREVENTION FOR OPEN CAVITY SOLAR RECEIVERS

Don H. Ross, Newton, Mass., and Theodore J. Nussdorfer, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 932,170, Aug. 9, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 160,036
Int. Cl.³ F24J *3/02*; A62B *7/00*
U.S. Cl. 126—418 **3 Claims**



1. Apparatus for preventing heat loss in an open cavity solar energy receiver having an aperture at the open end, comprising:
a wind deflector projecting outwardly from the aperture of said receiver;
means for forming diverging jets of fluid projecting outwardly from said wind deflector at the ends of said deflector for deflecting airflow away from said open end such that the reattachment point, if any, is removed from said apparatus, said means including a fluid source feeding said fluid through a connecting conduit to the ends of said deflector.

4,312,325

SOLAR HEATING SYSTEM

Kenneth Voges; Elroy A. Schoenbeck; Mark F. O'Hara, and Thomas E. Schmitt, all of Red Bud, Ill., assignors to Red Bud Industries, Inc., Red Bud, Ill.

Filed Mar. 17, 1980, Ser. No. 130,630
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—423 **35 Claims**

1. For use in a solar heating system, the combination comprising: at least one solar collector having its one end mounted higher than its other end and including a surface that is capable of absorbing a substantial amount of heat from the rays of the sun, means for enclosing a cavity behind the heat absorbing surface with the cavity being capable of holding a heat transfer fluid, a supply pipe extending along the cavity-enclosing means and having its ends easily accessible at the upper and lower ends of the collector, the supply pipe having its interior in communication with the lower region of the cavity, and a drain pipe extending along the cavity enclosing means and

having its ends easily accessible at the upper and lower ends of the collector, the drain pipe having its interior in communication with the cavity at the upper region of the cavity; a manifold located below and adjacent to the lower end of the collector and including a pressure pipe having a supply fitting, and a return pipe located alongside the pressure pipe and having a drain fitting; and first coupling means for connecting the supply pipe of the collector and the supply fitting of the manifold and second coupling means for connecting the drain pipe of the collector and the drain fitting of the manifold, all to enable the heat transfer fluid to flow from the pressure pipe of the manifold, through the cavity of the collector where it is heated, and thence into the return pipe of the manifold, the first and second coupling means being detachable from the collector and further being configured to enable the respective pipes and fittings that they connect to be joined together and taken apart by moving the collector with respect to the manifold, whereby the collector may in effect be plugged into the manifold and also another collector of similar construction may be plugged into the said one collector at the upper end thereof to communicate with the pressure and return pipes of the manifold through the supply and drain pipes of said one collector.

4,312,326

ELECTRO-MAGNETIC RADIATION REFLECTIVE CONCENTRATOR

Alfred L. Johnson, Jr., Manhattan Beach, Calif., assignor to LaJet Energy Company, Abilene, Tex.

Filed May 30, 1980, Ser. No. 155,016
Int. Cl.³ F24J 3/02; F28F 9/00
U.S. Cl. 126—424 **12 Claims**

1. An electro-magnetic radiation reflective concentrator comprising:

a main support;

a cantilever beam coupled to said main support;

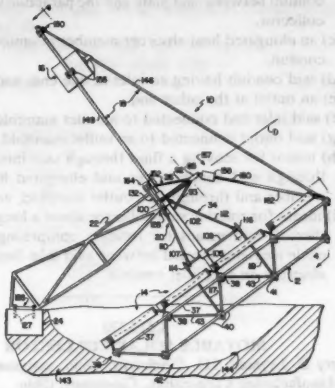
a rigid frame;

an absorber of electro-magnetic radiation;

an intermediate support rigidly interconnecting said frame and said absorber;

a plurality of electro-magnetic radiation reflectors coupled to said frame and aimed at said absorber; and

means for suspending said frame, reflectors, absorber and intermediate support from said cantilever beam;



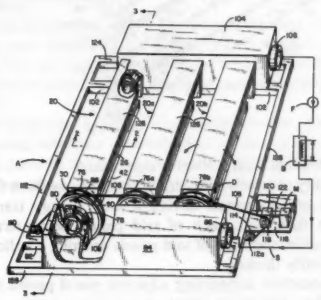
said means being located between said reflectors and said absorber.

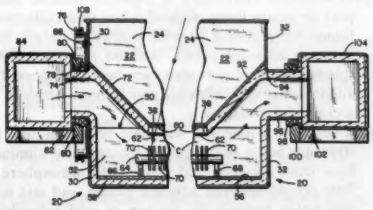
4,312,327

SOLAR ENERGY TRACKING AND COLLECTOR APPARATUS

Clair B. Marshall, Star Rte. Box 21a, Isle, Minn. 56342, and Larry A. Marshall, Rte. 3, Box 222, Onalaska, Wis. 54650

Continuation of Ser. No. 31,217, Apr. 18, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,321
Int. Cl.³ F24J 3/02
U.S. Cl. 126—424 **9 Claims**





9. A solar energy tracking and collector apparatus comprising:

(a) at least one collector including an elongated reflective means having a parabolic surface in cross-section,

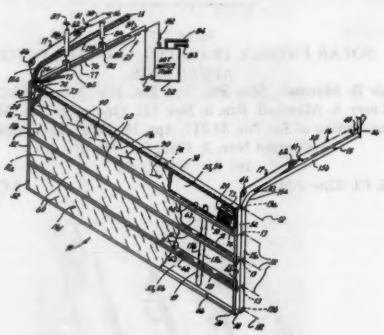
(b) a transparent plate connected at its edges within the parabolic surface of the reflective means and forming a conduit between said plate and the parabolic surface of the collector,
(c) an elongated heat absorber member mounted within said conduit,
(d) said conduit having an inlet at one end, and
(e) an outlet at the other end,
(f) said inlet end connected to an inlet manifold and
(g) said outlet connected to an outlet manifold,
(h) means for moving a fluid through said intake manifold, through said conduit over said elongated heat absorber member and through said outlet manifold, and
(i) means for rotating said collector about a longitudinal axis thereof, said means for rotating comprising pulley and cable elements located between said inlet header and said absorber on said inlet conduit.

4,312,328

MOVABLE SOLAR COLLECTOR

Harry S. Leyman, III, Cincinnati, Ohio, assignor to Leyman Manufacturing Corporation, Cincinnati, Ohio

Filed Feb. 9, 1979, Ser. No. 10,611
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—426 **33 Claims**



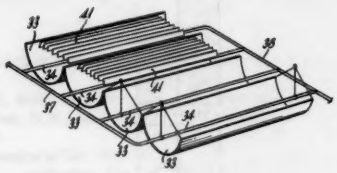
1. A movable solar collector comprising
a plurality of panels structurally separate one from the other, each of said panels having a solar energy transmitting front face wall, each of said panels being structurally inflexible, and each of said panels defining a hollow space interiorly thereof,
hinge structure connecting adjacent plural panels one with another, said hinge structure permitting movement of all said inflexible panels together between first and second positions as desired by the user, and all said inflexible panels being exposable to solar energy in one of said first and second positions,
port structure established in adjacent flexible panels, said port structure being aligned when said collector is positioned for exposure to solar energy to permit fluid flow between adjacent panels, without loss thereof to atmosphere, and said port structure being temporarily out of alignment as said inflexible panels move between said first and second positions,
seal structure connected with said port structure, said seal structure being seal tight to substantially eliminate fluid flow from between said panels into atmosphere as fluid flow occurs between adjacent panels, and said seal structure being temporarily broken as said inflexible panels move between said first and second positions, and
conduit means connected with said hollow panel structure at one end and connectable with a use location at the other end, said conduit means permitting the heat of said fluid, as generated by exposure of all said panels to solar energy, to be transferred from said collector to said use location.

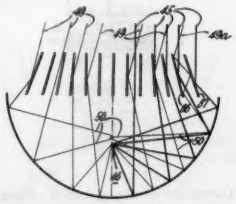
4,312,329

FOCUS IMPROVER AND SOLAR ENERGY COLLECTOR

Thomas R. Carver, Princeton, N.J., and Fontaine C. Armistead, Darien, Conn., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation of Ser. No. 965,136, Nov. 3, 1978, abandoned. This application Jul. 28, 1980, Ser. No. 172,601
Int. Cl.³ F24J *3/02*; G02B *5/08*
U.S. Cl. 126—439 **16 Claims**





1. Solar heat collector, comprising
a concave cylindrical reflecting surface,
a plurality of narrow flat reflecting strips oriented with the longitudinal dimensions thereof parallel to the geometric axis of said cylindrical surface, and
means for setting said strips at predetermined angles to correct for cylindrical aberration in focusing of parallel rays directed toward said concave reflecting surface.

4,312,330

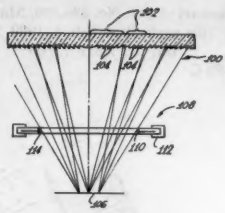
FOCUSING DEVICE FOR CONCENTRATING RADIATION

David W. Holdridge, Fullerton, Calif., assignor to Swedlow, Inc., Garden Grove, Calif.

Continuation-in-part of Ser. No. 163,343, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 936,106, Aug. 23, 1978, abandoned. This application Aug. 18, 1980, Ser. No. 178,915
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—440 **15 Claims**

1. A focusing device for use in concentrating radiation and producing a prescribed distribution of radiation on a target surface, said device comprising:
a body positioned adjacent the target surface and adapted to receive radiation, said body having a plurality of discrete radiation focusing segments each including a plurality of discrete focusing surfaces formed therein;
wherein each of said focusing surfaces of each one of said focusing segments has a prescribed angle relative to the radiation it receives, causing such radiation to be redirected by the focusing surface to a predetermined portion of the target surface, wherein the paths of redirected radiation, if not interrupted by the target surface, do not all converge at a common point, wherein the radiation

redirected onto the target surface by each of said focusing segments has the prescribed radiation distribution, and



wherein a superposition of the radiation redirected by all of said focusing segments likewise produces the prescribed distribution of radiation over the target surface.

4,312,331

REANIMATION TABLE FOR NEWBORN BABIES AND INFANTS

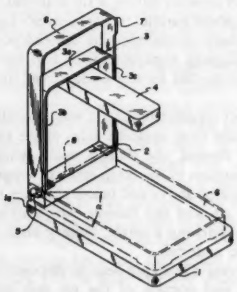
Gunther Hahmann, Lubeck, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,594

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913282

Int. Cl.³ A61G *11/20*

U.S. Cl. 128—1 B **6 Claims**



1. A reanimation table for a newborn infant comprising a receiving member having a top surface defining a substantially planar lying surface for receiving the infant, a base member mounted on said lying surface adjacent one end of said receiving member, a yoke member mounted on said base member and extending vertically upwardly therefrom, a radiation heater connected to said yoke member and extending outwardly over said lying surface, and a protective wall pivotally mounted to said base member, said protective wall comprising a single U-shaped part having leg portions on each side pivotally mounted adjacent each end of said base member and a web interconnecting said leg portions, said protective wall being pivotal between a first substantially horizontal position in engagement with said lying surface in which said leg portions and web extend upright to form with said base member an enclosure for the infant over said lying surface and a second position in which said protective wall may extend substantially upright out of engagement with said lying surface.

4,312,332

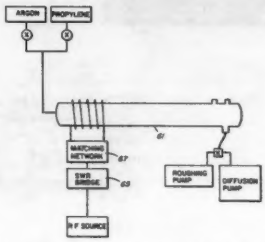
OXYGEN SENSING

Gregory L. Zick, Kirkland, Wash., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 25, 1980, Ser. No. 143,928

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **8 Claims**



1. Apparatus for measuring the oxygen content of a patient's blood, said apparatus comprising:

a thin flat substrate having front and back surfaces, the front surface being adapted to contact a patient's skin;

a noble metal cathode extending through said substrate from the back surface to the front surface where a limited area is exposed;

on said front surface, silver/silver chloride reference electrode;

printed onto the back surface of said substrate, a resistor for heating said substrate;

over at least the front surface of said substrate with said electrodes, a coating of an in situ plasma polymerized coating;

feedback-controlled means for energizing said resistor to heat said substrate to a predetermined temperature suitable for producing hyperemia in the adjacent tissue of a patient to whom the front face of the substrate is applied; and

circuit means for applying a potential between said cathode and said reference electrode and for measuring the resultant current, the current so measured being a function of the oxygen content of the patient's blood.

4,312,333

TACTILE STIMULATING MECHANISM

Gail B. Dreybus, 123 James Landing Rd., Newport News, Va. 23606

Continuation of Ser. No. 59,986, Jul. 23, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,705

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—49 **8 Claims**

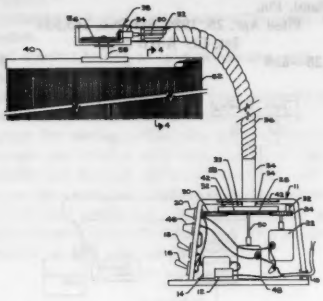
1. A portable tactile stimulating massage apparatus comprised of:

a shaft containing flexible filaments depending downwardly therefrom;

a means of support or arm for said shaft capable of causing motion of said filaments in a continuous circular pattern;

a flexible, bendable shaft connected thereto capable of simultaneous arcuate motion in a continuous pattern;

power means for moving said filaments in abovementioned circular and arcuate motions;



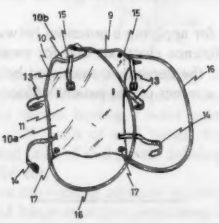
housing base for said power means of sufficient structure to stabilize said apparatus on any flat surface.

4,312,334

BRACE FOR THORAX FRACTURES

Antonio S. Munoz, Lazaro de Baigorri 419, Chihuahua, Chih., Mexico

Filed Jul. 26, 1979, Ser. No. 61,159
Int. Cl.³ A61F *5/02*
U.S. Cl. 128—78 **3 Claims**



1. A brace for thorax fractures which permits ambulatory movement of a patient without need of remaining in an orthopedic bed or in intensive therapy, which comprises a rigid square shaped and curved back member having upper ends bent around the patient's shoulders and an internal concave face corresponding approximately to the shape of a patients back to cover the area between shoulders and waist;

two adjustable belts extending from the upper ends of the back member to sides thereof and adapted to pass under the patient's armpits;

an adjustable belt extending between lower ends of the back member at the patient's waistline;

and curved rib members extending outwardly from the upper ends to the lower ends of the back member and fixed thereto;

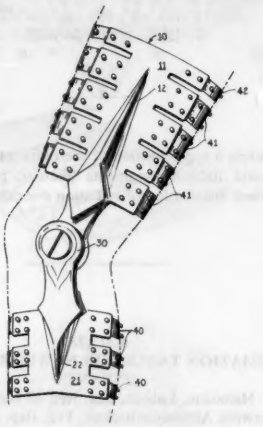
whereby fractures or sunken sections of the patient's thorax can be wired to the rib members to maintain them in desired suitable position while osseous callus is formed.

4,312,335

CUSTOM-FITTED KNEE GUARD AND BRACE

Roy B. Daniell, Jr., 4221 N. Shallowford Rd., Apt. 4, Chamblee, Ga. 30341

Continuation-in-part of Ser. No. 896,990, Mar. 17, 1978, Pat. No. 4,233,967. This application Feb. 4, 1980, Ser. No. 117,958
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—80 C **8 Claims**



1. A knee guard and brace, which comprises:

(a) inside and outside members which are adapted to fit on the inner and outer sides, respectively, of a wearer's leg; each side member comprising a pair of thigh and calf support members;

(b) each support member having a rib with end portions, the rib being disposed parallel to the wearer's leg;

(c) means pivotally interconnecting the end portions of the ribs in overlapping engagement, so that the pair of ribs when interconnected form a bridge over the side of the knee joint;

(d) each support member having at least two flanges which extend laterally from opposite sides of the rib and to the distal edges thereof, the flanges being wholly disposed within the portions of the thigh and calf support members which are located above and below the knee joint, respectively; each rib and the flanges which extend laterally therefrom comprising a single, unitary piece formed of a thermoplastic material;

(e) each rib having a bridging section disposed between the overlapping end portion of the rib and the proximate edges of the flanges;

(f) a reinforcing abutment joining the bridging section of each rib to the flanged portion thereof, the thickness of each rib in a direction generally perpendicular to the contiguous surface of a wearer's leg being substantially greater in those portions thereof in which the reinforcing abutment is joined to the bridging section than in the remainder of the bridging section, thereby facilitating the transmission of loads away from the pivotal joint and to the large muscles of a wearer's leg; the abutment having a taper both in width and in thickness in a direction away from the proximate edges of the flanges and toward the distal edges of the support member; and

(g) a plurality of straps connecting the upper flanges to each other and the lower flanges to each other, so that the knee guard and brace forms a pair of upper and lower encasements which can be fitted to a wearer's leg above and below the knee and which, in combination with the interconnected end portions of the ribs, inhibit torsional twisting of the wearer's leg.

4,312,336

EXTERNAL AXIAL FIXATION UNIT

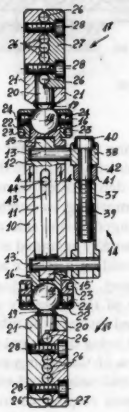
Giuseppina Danieletto; Giovanni De Bastiani, both of Verona; Giovanni Faccioli, Monzambano; Lodovico Renzi Brivio, Castenedolo; Roberto Aldegheri, S. Giovanni Lupatoto, and Andrea Cavazzana, Verona, all of Italy, assignors to Orthofix S.r.l., Italy

Filed Nov. 13, 1979, Ser. No. 93,897

Claims priority, application Italy, Nov. 10, 1978, 84949 A/78; Apr. 5, 1979, 84930 A/79

Int. Cl.³ A61F 5/04; F16C 11/06, 3/00

U.S. Cl. 128—92 A 19 Claims



1. Apparatus for the external setting or securing of the parts of a fractured bone, said apparatus comrising an elongate central body member which is comprised of two parts adapted to be mutually displaceable parallel to the longitudinal axis of said member and rotatably fixed at all times with respect to each other, whereby each part of said central body member supports a clamping device for pins adapted to be inserted into a part of the bone, further including a pressing and tensioning device in engagement with both said two parts of said central body member, wherein said two parts of said central body member are telescopically inserted one within the other, wherein each of said clamping devices is mounted on a respective one of said parts of said central body member through a respective ball joint having a center of rotation which substantially lies on the longitudinal axis of said central body member, and securing devices for fixing the mutual rotative position of said parts of said central body member when said two parts of said central body member are being mutually longitudinally displaced and for fixing both the mutual rotative and longitudinal positions of said parts of said central body member after said mutual longitudinal displacement, wherein said pressing and tensioning device is removably connected to the parts of the central body member, and wherein said pins, at least in the section insertable in the bone, have an external thread.

4,312,337

CANNULA AND DRILL GUIDE APPARATUS

Brian T. Donohue, 21 Oak Dr., Oak Ridge, N.J. 07438

Filed Sep. 8, 1980, Ser. No. 185,277

Int. Cl.³ A61B 17/18; A61F 5/04, 17/32; A61B 17/06

U.S. Cl. 128—92 EB 3 Claims

1. A surgical cannula and guide instrument for drilling holes and guiding wires therethrough, comprising;

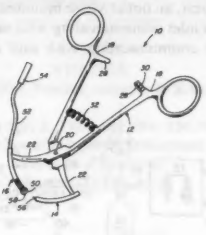
a guide portion having two elongated, scissor-like handle arms;

said handle arms being pivotally secured to one another by a pivot pin;

each of said handle arms having a jaw extension beyond the pivot junction;

a hollow tubular cannula section secured to the outer end of each of said jaw extensions;

one of said cannula sections having a chamfer on the interior surface of the medial end so as to form an interlock with the medial end of the other cannula section;



said cannula sections having a size and shape and being mounted such that when said handle arms are pivoted to a closed position, said cannula sections become engaged and form one continual cannula;

said cannula sections having a hollow interior such that a wire may be fed through said continual cannula.

4,312,338

SURGICAL MASK

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Filed Jan. 21, 1980, Ser. No. 113,578

Int. Cl.³ A61F 9/04

U.S. Cl. 128—201.12 8 Claims

4. A surgical mask adapted to cover part of the nose, the mouth and the chin of a person wearing spectacles having a nose-bridge, said mask having an upper edge adapted to be located below said nose-bridge, and spectacle support means attached to the mask adjacent said upper edge and adapted to extend upwardly and against the front of the nose-bridge when said mask is in use for retaining the spectacles in a selected position on the nose of the wearer.

4,312,339

DEVICE FOR ADMINISTERING AN ANESTHETIC GAS

James W. Thompson, Sr., Horsham, Pa., assignor to Porter Instrument Co., Inc., Hatfield, Pa.

Filed Mar. 31, 1980, Ser. No. 135,262

Int. Cl.³ A61M 16/00

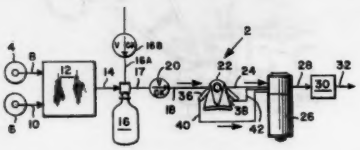
U.S. Cl. 128—205.25 7 Claims

1. In a system for administering an anesthetic gas to a patient having a mask, means for supplying an anesthetic gas to said mask when the patient inhales, an exhaust line having its proximal end connected to the mask and adapted to have its terminal end connected to a vacuum system for exhausting gas from the mask to a remote atmosphere when the patient exhales, the improvement comprising:

a closed reservoir having an inlet opening and an outlet

opening connected in series with said exhaust line between the proximal and terminal ends thereof comprising a hollow body having an open end,

a cap closing the open end and including said inlet opening connected to the portion of the exhaust line upstream of the reservoir, said outlet opening communicating said reservoir with a portion of the exhaust line downstream of the reservoir, an outlet valve mounted within said cap and having an inlet communicating with said inlet opening and an outlet communicating with said reservoir, said inlet



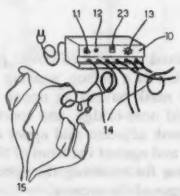
defining a valve seat, a diaphragm mounted adjacent said seat in the cap with its periphery secured to the cap, said diaphragm being located in said cap such that one side of the diaphram is adapted to contact said seat and said inlet opening communicates with an area of said one side of the diaphram which is substantially larger than the area of the diaphram adapted to contact the valve seat to keep the diaphram against the valve seat when the patient is inhaling and to allow a free flow of gas when the patient is exhaling.

4,312,340

METHOD FOR RESTORING OPTIMUM SKIN CONDITIONS, ESPECIALLY FOR PARTIALLY OR ENTIRELY HEALING INTRADERMAL TEARS

Franco Donadelli, Via Bronzino, 6, Milan, Italy

Continuation-in-part of Ser. No. 869,032, Jan. 6, 1978, abandoned. This application Jun. 7, 1978, Ser. No. 893,075
Claims priority, application Italy, Apr. 7, 1977, 22185 A/77
Int. Cl.³ A61N *1/30*
U.S. Cl. 128—207.21 **9 Claims**



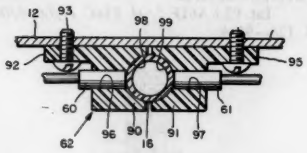
1. A method of treatment of cicatrized human skin, comprising applying at a derma level of a scarred area underlying the cicatrized skin a low-frequency non-ionizing variable electric field for a predetermined time and simultaneously applying an aqueous proteinic solution made of tissue-regenerating extracts to a surface level of said scarred area so that the scarred area is located between the electric field and the solution thereby provoking a reaction leading to proteinic synthesis, said solution being prior to its application to the human skin subjected to a chemical and electrical pre-treatment which includes exposing the solution to an electrolysis reaction for a number of days and subsequently applying a low-frequency alternating electric field to the solution for a number of days, to thereby eliminate or reduce discontinuities in the skin caused by cicatrices, lesions and intradermal tears.

4,312,341

BUBBLE DETECTOR

Nick Zissimopoulos, Schaumburg, and John Baron, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 13, 1979, Ser. No. 103,040
Int. Cl.³ A61M *5/16*
U.S. Cl. 128—214 E **8 Claims**



1. In a flow metering apparatus for controlling the flow of fluid through an administration set of the type having transparent tubing subject to deformation from internal fluid pressure, a bubble detector comprising, in combination:

a light source arranged at one side of the tubing;

a light detector generally arranged at the opposite side of the tubing opposite said light source and defining a light path through the tubing, said detector generating an output signal indicative of the intensity of light from said light source transmitted through the tubing, the intensity of said transmitted light being dependent on the presence of fluid within the lumen of the tubing and on the shape of the lumen between said source and said detector;

control circuit means responsive to said output signal for interrupting operation of the flow metering apparatus upon the intensity of said transmitted light falling below a predetermined minimum level; and

platen means comprising a pair of forming members engaging said tubing from opposite sides thereof about a substantial portion of the circumference of the tubing adjacent said light path for preventing deformation of the tubing and consequent changes in the intensity of said transmitted light with fluid pressure changes in the lumen of the tubing, at least one of said forming members being mounted for movement in a direction generally perpendicular to the axis of the tubing so as to be disengageable from the tubing to facilitate insertion or removal of the tubing from said platen means.

4,312,342

I.V. ADMINISTRATION FLOW RATE GAUGE

Richard M. Chittenden, Grayslake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 9, 1980, Ser. No. 157,919
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R **20 Claims**

1. An apparatus for the measurement of liquid flow within a gravitational flow system comprising:

a primary tube having its distal end in fluid communication with a source of liquid, said primary tube being disposed substantially downwardly from said liquid source;

a secondary tube having its proximal end in fluid communication with said primary tube, said secondary tube being disposed substantially vertically therefrom;

a tertiary tube having its proximal end in fluid communication with said primary tube, said tertiary tube being disposed substantially vertically therefrom;

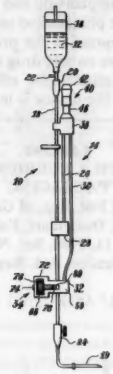
constrictor means positioned at said primary tube proximate from the opening from said tertiary tube to said primary tube for the restriction of liquid flow therethrough whereby a pressure differential may be created between said primary tube proximate said secondary tube and said

primary tube proximate said tertiary tube when liquid flows through said primary tube;

connector means between the distal ends of said secondary tube and said tertiary tube adapted for fluid communication therebetween;

a portion of said secondary and tertiary tubes being substantially transparent whereby the relative position of said liquid in said tube or tubes may be seen; and

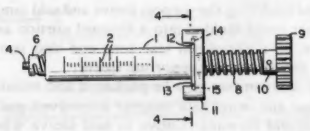
visual indicia means systematically displaced on said transparent tube or tubes for the comparing relative position of said liquid within said tube to a known standard whereby the rate of flow of said liquid within said primary tube may be determined.



4,312,343
SYRINGE

Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y. 11209, and Robert F. LeVeen, 122 S. 51st St., Omaha, Nebr. 68132

Filed Jul. 30, 1979, Ser. No. 61,642
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 C **2 Claims**



1. In a manually actuable syringe comprising:

a hollow body with an interior wall, a fluid transport opening at one end thereof and a piston receiving opening at the opposite end thereof;

a piston within said body which has fluid tight engagement with said interior wall, said piston being slidable toward and away from said transport opening;

a threaded rod secured to said piston and extending at one end from said piston receiving opening; and

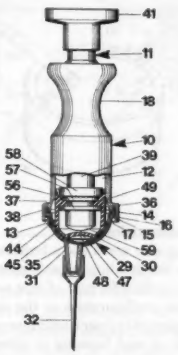
a collar mounted on said rod, said collar having a threaded portion mating with the threads on said rod and said collar and said rod being rotatable relative to each other to cause relative movement of said collar and said rod in a direction longitudinally of said rod;

the improvement which comprises co-operating and interengaging means on said body and said collar for releasably securing said collar to said body and thereby preventing movement of said collar in a direction extending from one end to the other of said body, whereby rotation of said rod causes said piston to move in said direction including a pair of spaced projections on said body adjacent said opposite end thereof which extend radially outwardly from said body and which are spaced from each other circumferentially of the body, said projections having a circumferential length less than one-half of the circumference of said body, and slots in said collar for receiving said projections, said projections engaging walls of said slots when said collar is adjacent said opposite end and is rotated through a partial turn.

4,312,344
SYRINGE

Nils B. Nilson, Mjölby, Sweden, assignor to Kenova AB, Malmo, Sweden

Filed Apr. 3, 1980, Ser. No. 136,763
The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.
Int. Cl.³ A61M *5/24*
U.S. Cl. 128—216 **26 Claims**

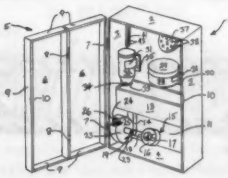


1. A syringe comprising an elongated barrel having a discharge end, a container, means for removably attaching the container to the discharge end of the barrel to form the end wall thereof, said container having a substantially rigid first wall portion at the exterior side of the end wall and forming an inside surface, and a flexible second wall portion at the interior side of the end wall and introvertible upon the inside surface of the first wall portion, a nozzle on said first wall portion for attaching a hypodermic needle thereto, and a plunger reciprocably mounted in the barrel, the stroke volume of the plunger between displaced positions thereof corresponding to the container being empty and filled, respectively, being substantially equal to the volume of the container.

4,312,345
HYGIENIC CABINET

Johnnie F. Colvin, 305 Arkansas St., Ruston, La. 71270

Filed Apr. 14, 1980, Ser. No. 139,772
Int. Cl.³ A61M *3/00*
U.S. Cl. 128—229 **10 Claims**



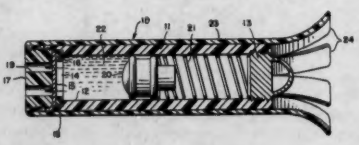
1. A hygienic cabinet comprising:

(a) an enclosure;
(b) a tank mounted in said enclosure;
(c) hose means mounted in said enclosure beneath said tank;
(d) water supply means mounted in said enclosure and connected to a source of water;
(e) water conduit means connecting said tank, said hose means and said water supply means; and
(f) a three-way, four position valve cooperating with said conduit means for selectively permitting water to flow from said water supply means to said tank and said hose means, and fluid to flow from said tank to said hose means.

4,312,346
EXPANDABLE ASHTRAY
Charles E. Grigg, 24551 Big Basin Way, Saratoga, Calif. 95070
Filed Mar. 31, 1980, Ser. No. 136,177
Int. Cl.³ A24F *19/00*
U.S. Cl. 128—242 **1 Claim**

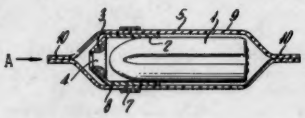
1. An ashtray comprising:
a housing having side walls and a bottom forming an internal compartment for holding cigarettes and refuse;
an intermediate section formed of side walls having the same cross-sectional configuration as the side walls;
first means to releasably fasten said intermediate section onto the side walls of said housing to extend and enlarge said internal compartment;
a top having a bottom wall and side walls to form an open receptacle to hold cigarettes and refuse;
second means to releasably fasten said top onto said intermediate section to close said internal compartment and seal the cigarettes and refuse in the compartment from the surrounding environment; and
said first and second means to releasably fasten comprising pins extending inward from the housing and intermediate section and side extensions on said top and intermediate section such that by placing said top and intermediate section or said top and housing together and turning one relative to the other the included side walls are fastened together.

4,312,347
POSITIVE PRESSURE DRUG RELEASING DEVICE
Keith E. Magoon; Lawrence E. Evans, and Frederick B. Hembrough, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Feb. 25, 1980, Ser. No. 124,542
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—260 **9 Claims**



1. A positive pressure drug releasing device comprising an elongated casing having a tubular side wall defining a chamber; said casing being open at one end and having an end wall at the other end thereof; a diffusion membrane secured to said casing and extending across said open end; a plunger slidably disposed within said chamber for axial movement therein; a drug solution in said chamber between said plunger and said membrane; said drug solution being diffusable through said membrane and absorbable by the body wall of a cavity in which said device is implanted; and a compression spring interposed between said plunger and said end wall; said spring being in a state of compression for producing a substantially uniform positive pressure on said drug solution of a magnitude sufficient to render negligible the effects of back diffusion osmotic pressure when the device is in use.

4,312,348
TAMPON PACK WITH A LUBRICANT DEPOT IN THE PACKAGING
Axel Friese, Wuppertal, Fed. Rep. of Germany, assignor to Dr. Carl Hahn, G.m.b.H., Dusseldorf, Fed. Rep. of Germany
Filed Apr. 11, 1980, Ser. No. 139,314
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928356
Int. Cl.³ A61F *15/00, 13/20*
U.S. Cl. 128—263 **9 Claims**

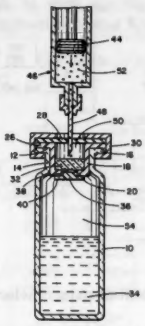


1. In combination, a tampon for digital insertion and packaging therefor comprising:
said tampon having a forward end and a rear end;
a supporting sleeve having a forward end and a rear end, a rear portion of said supporting sleeve slidably surrounding the periphery of a forward portion of the tampon and the forward end of said sleeve spaced away from the forward end of the tampon;
a lubricant depot on the inside of said sleeve, at the forward portion thereof spaced away from said forward end of said tampon; and
a wrapper enclosing the support sleeve and said tampon, said wrapper being divided into a forward portion and a rear portion by a peripheral tear zone and said rear portion being joined to said supporting sleeve;
whereby said tampon may be packaged and remain free of lubricant and, when said wrapper is removed, said tampon may be slid forward relative to said sleeve whereupon, said lubricant will be transferred to the front portion of said tampon.

4,312,349
FILTER DEVICE FOR INJECTABLE FLUID
Milton J. Cohen, 10823 Burbank Dr., Potomac, Md. 20854
Continuation-in-part of Ser. No. 59,670, Jul. 23, 1979. This application Jan. 14, 1980, Ser. No. 111,848
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ A61J *1/00*
U.S. Cl. 128—272 **4 Claims**

1. A device for filtering fluid during flow into and out of the device comprising a vial open at one end and adapted partially to be filled with the fluid, a container which extends into the open end portion of the vial, said container being open at one end and closed at the other end with the open end of the container alongside the open end of the vial, a passage through the closed end of the container communicating the interior of the container with the portion of the vial beyond the container, a removable sealing plug seated within the passage to maintain separation between the interior of the container and the inte-

rior of the portion of the vial beyond the container, a rupturable sealing disc sealing the open end of the vial and container, a filter member positioned within the container to extend across the passage in sealing engagement with the surrounding container walls and spaced from the open end, to provide a



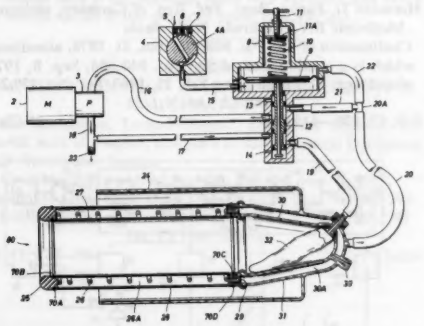
compartment in the container between the sealing disc at one end and the filter member at the other end whereby when a syringe is inserted through the rupturable disc into the portion of the container between the rupturable disc and the filter for introduction or withdrawal of fluid to and from the vial, such fluid must pass through the filter member.

4,312,350

APPARATUS FOR COLLECTING SEMINAL FLUIDS

Rosetta C. Doan, 4580 Beechnut, Apt. 110 East Court, Houston, Tex. 77096

Filed Aug. 23, 1979, Ser. No. 68,897
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—276 **14 Claims**



1. An apparatus for collecting seminal fluids and the like, comprising:

an outer housing member,

a flexible elongate tubular member positioned at least partially within said housing member and having a closed end and a rim defining an open end opposite said closed end,

vacuum regulator means for causing said rim to move from a first position to a second position toward said closed end of said tubular member,

vacuum pump means in fluid communication with said vacuum regulator means,

restoring means for returning said rim from said second position to said first position,

a drain in said closed end of said tubular member, and

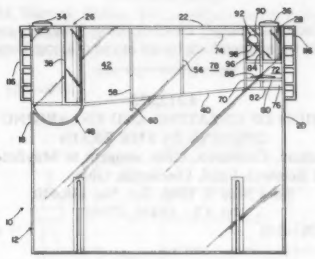
semen collector means adapted for fluid communication with said drain for removing seminal fluids from said closed end of said tubular member, said semen collector means including a semen chamber, a piston slidable within said semen chamber, and valve means for selectively isolating said semen chamber from the atmosphere.

4,312,351

DRAINAGE DEVICE WITH SEPARATE OUTFLOW CHAMBER

Leonard D. Kurtz, 46 Woodmere Blvd., Woodmere, N.Y. 11598, and Robert E. Bidwell, 27 Montrose Pl., Long Island, N.Y. 11746

Filed Dec. 26, 1979, Ser. No. 107,329
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—276 **11 Claims**



1. A drainage device comprising a closed container, an inlet to said container in the upper end thereof, a partition extending at least partially across said container to form a collection chamber beneath the partition and an underwater seal chamber above the partition, an outlet to atmosphere from said container, an outlet chamber formed within said container and surrounding said outlet to atmosphere, a discrete passageway extending above said partition in said underwater seal chamber and adjacent the upper end of said container to an inlet opening in said outlet chamber, one-way valve means disposed in said outlet chamber and in the path of fluid flow through the inlet to said outlet chamber and the outlet to atmosphere, an opening in said partition to permit flow of liquid from said underwater seal chamber to said collection chamber, and means in said underwater seal chamber for inhibiting the flow of liquid through said discrete passageway.

4,312,352

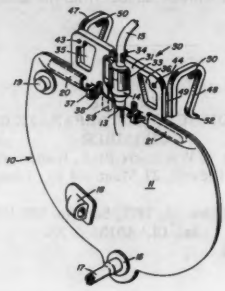
HANGER, HOOK AND HANDLE ASSEMBLY FOR URINARY DRAINAGE BAG

Charles E. Meisch, Hasbrouck Heights, and Robert N. Baker, Basking Ridge, both of N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 29, 1980, Ser. No. 116,625
Int. Cl.³ A61F *5/42*
U.S. Cl. 128—294 **7 Claims**

1. In combination with a urine drainage bag having an inlet adapted for connection to a urinary catheter, and a support for said bag, the improvement comprising the support for the bag including an elongated main frame member having opposed ends, means for attaching said main frame member to the top of said bag, finger receiving apertures in said main frame member to facilitate carrying said bag and a hook-shaped hanger member hingedly connected to each end of said main frame member and movable to either a stowed position overlying said main frame member, or to a use position at substantially right angles

to said main frame member, wherein said main frame member and hanger members are formed of a single piece of plastic



material, each said hanger member being integrally connected to the main frame members by an integral living hinge.

4,312,353

METHOD OF CREATING AND ENLARGING AN OPENING IN THE BRAIN

Set Shahbabian, Cincinnati, Ohio, assignor to Mayfield Education and Research Fund, Cincinnati, Ohio

Filed May 9, 1980, Ser. No. 148,410
Int. Cl.³ A61M *29/02*
U.S. Cl. 128—344 **6 Claims**

1. The method of forming an opening in the brain with minimal damage to nerve tissue, comprising the steps of,

inserting into the brain a catheter formed by a stylette surrounded by a thin, inflatable sac, said catheter having a projecting end approximately 3 mm in diameter, said end being tapered,

easing said catheter through the brain connective tissue and past said nerve tissue, and

gradually injecting a fluid into said inflatable sac to gently expand it, thereby pushing aside nerve tissue with minimal damage to the nerve tissue.

4,312,354

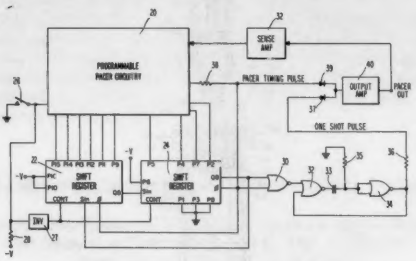
PACEMAKER WITH CIRCUIT FOR PULSE WIDTH MODULATING STIMULUS PULSES IN ACCORDANCE WITH PROGRAMMED PARAMETER CONTROL STATES

Robert A. Walters, Murrysville, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Filed Feb. 4, 1980, Ser. No. 118,060
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **6 Claims**

1. A programmable heart pacer for generating stimulus pulses, said pacer having controllable operating parameters, and having a control circuit responsive to an externally generated program signal which is received by said pacer, said control circuit controlling one or more selected operating pacer parameters, each of said parameters having a corresponding control state, comprising:

generating means for generating one or more parameter signals in a known sequence, said parameter signals corresponding to the control states of selected operating parameters; and



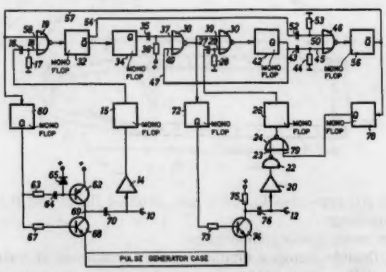
modulating means for pulse width modulating said pacer stimulus pulses with, said selected operating parameter signals, to provide a signal indicative of said control states and thus of one or more operating parameters.

4,312,355

HEART PACEMAKER

Hermann D. Funke, Bonn, Fed. Rep. of Germany, assignor to Medtronic B.V., Kerkrade, Netherlands

Continuation of Ser. No. 868,575, Jan. 11, 1978, abandoned, which is a continuation of Ser. No. 940,694, Sep. 8, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,237
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **25 Claims**



1. Electric heart pacemaker comprising circuit means for detecting and, if required, stimulating ventricular action, circuit means for detecting and, if required, stimulating atrial action, and further circuit means for triggering ventricular stimulation unless a spontaneous ventricular action follows within a first predetermined time interval after either a detected spontaneous or a stimulated atrial action, as well as circuit means for triggering an atrial action unless a spontaneous atrial action follows within a second predetermined time interval after either a detected spontaneous or a stimulated ventricular action.

4,312,356

PACEMAKERS FOR TACHYCARDIA CONTROL

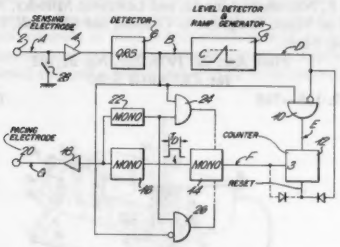
George E. Sowton, 10 Beach Ave., Sanderstead, Surrey, England, and Alan J. Smale, London, England, assignors to George Edgar Sowton, Sanderstead, England

Filed Feb. 26, 1980, Ser. No. 124,667

Claims priority, application United Kingdom, Mar. 7, 1979, 07998/79

Int. Cl.³ A61N 1/36

U.S. Cl. 128—419 PG 17 Claims



1. A pacemaker for tachycardia control, comprising:

means for sensing the onset of a tachycardia;

means responsive to said sensing means for issuing a stimulating pulse to the heart for arresting the tachycardia;

means for detecting the response of the heart to said stimulating pulse and, if said tachycardia was not arrested, for determining which of an incorrect early or late time said pulse was issued relative to the tachycardia beat; and,

means for controlling the stimulating pulse issuing means in response to said detecting means whereby, when the tachycardia is not arrested, to cause a subsequent stimulating pulse to be issued at an adjusted later or earlier time relative to the tachycardia beat, the subsequent pulse being issued later if the previous pulse was too early and being issued earlier if the previous pulse was too late.

4,312,357

TRANSILLUMINATION DIAGNOSTIC METHOD AND APPARATUS

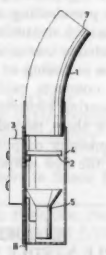
Torsten Andersson, Torna-Hällestad, and Björn Ohlsson, Veberöd, both of Sweden, assignors to Sinus Medical Equipment AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 857,696, Dec. 5, 1977, abandoned. This application Dec. 17, 1979, Ser. No. 104,392

Claims priority, application Sweden, Dec. 3, 1976, 7613587

Int. Cl.³ A61B 5/00

U.S. Cl. 128—664 5 Claims



1. A method of in situ differentially diagnosing pathological changes in human body tissue, comprising the steps of:

directing towards one side of the body tissue a shielded light transmitting instrument;

actuating a first low intensity light emitter in said instrument which comprises a tungsten filament, and which emits light from within the blue to within the infrared spectrum, which transilluminates the body tissue and visually indicates the presence of any anomalies in the tissue,

arranging infrared sensitive film at the opposite side of the body tissue, and

actuating a second light emitter emitting light from within the blue to within the infrared spectrum in said instrument to emit a second light of higher intensity than the light from said first emitter whereby light passing through the tissues makes an exposure on said infrared sensitive film.

4,312,358

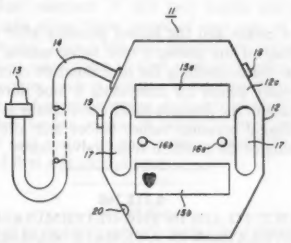
INSTRUMENT FOR MEASURING AND COMPUTING HEART BEAT, BODY TEMPERATURE AND OTHER PHYSIOLOGICAL AND EXERCISE-RELATED PARAMETERS

George M. Barney, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 23, 1979, Ser. No. 59,801

Int. Cl.³ A61B 5/04

U.S. Cl. 128—670 23 Claims



1. A body-mounted measuring instrument for computing velocity and distance travelled by a user engaged in physical exercise as a function of the user's heartbeat and the exercise time, said instrument comprising:

(a) heart beat sensing means for detecting heartbeats of the user and for generating electrical signals representative thereof;

(b) computing means responsive to said electrical signals for counting the number of detected heart beats and for determining the user's velocity and distance travelled during a period of physical exercise in accordance with a program instruction set stored in said computing means, said program instruction set representing a predetermined relationship between the number of detected heart beats during the exercise time and the user's velocity and distance travelled; and

(c) display means for displaying the results of selected computations performed by said computing means, said computations including the user's velocity and distance travelled during the exercise.

4,312,359

NONINVASIVE BLOOD PRESSURE MEASURING SYSTEM

Theodore A. Olson, Minneapolis, Minn., assignor to Life Care Systems, Inc., Minneapolis, Minn.

Filed Feb. 19, 1980, Ser. No. 122,371

Int. Cl.³ A61B 5/02

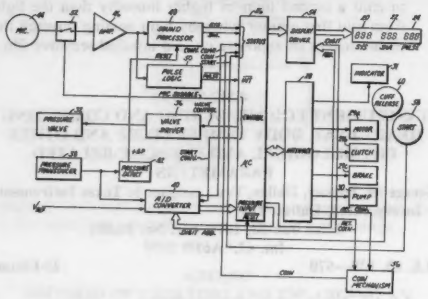
U.S. Cl. 128—680 18 Claims

1. A noninvasive blood pressure measuring apparatus comprising:

an inflatable cuff for encircling a portion of the human body;

means for inflating the inflatable cuff to a pressure sufficient to occlude arterial flow;

pressure relief valve means for deflating the cuff;
pressure sensor means for sensing the pressure within the cuff and providing digital pressure values as a function of the sensed pressure within the cuff; and
means for controlling the time duration of each opening of the pressure relief valve means as a function of the sensed pressure before a previous opening of the pressure reflief



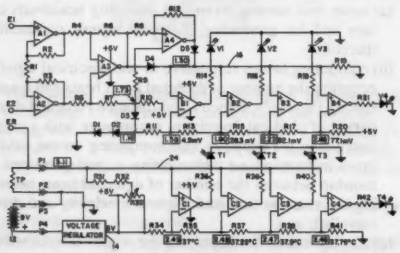
valve means and the sensed pressure after the previous opening of the pressure relif valve means, wherein the means for controlling the time duration comprises digital computer means for computing a time duration of each opening of the pressure relief valve means as a function of the digital pressure values before and after a previous opening of the pressure relief valve means.

4,312,360

DEVICE TO AID IN THE DETERMINATION OF OVULATION IN A FEMALE MAMALIAN

Julian C. Conway, 1369 Vue De Ville Ct., and James Andrews, 1344 Vue De Ville Ct., both of San Diego, Calif. 92109

Filed Feb. 25, 1980, Ser. No. 124,590
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—736 **10 Claims**



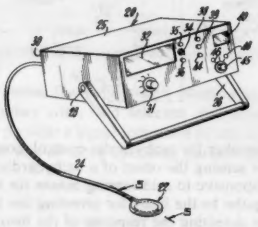
1. A body voltage and temperature measuring instrument comprising:
a housing which is sufficiently small to be held in a hand;
two electrical terminals on said housing which are accessible from the exterior of said housing;
a differential amplifier within said housing;
means coupling the input of said differential amplifier to said electrical terminals;
a first voltage ladder circuit within said housing coupled to the output of said differential amplifier;
a first plurality of output indicators on said housing which are visible from the exterior of said housing;
means coupling each of said output indicators to a separate rung of said voltage ladder;
a probe;
a temperature responsive element in said probe;
a second voltage ladder circuit within said housing coupled to said temperature responsive element;
a second plurality of output indicators on said housing which are visible from the exterior of said housing;
and means coupling said second plurality of output indicators to said second voltage ladder circuit.

4,312,361

PRESSURE MONITORING SYSTEM FOR ELECTROFLUIDIC SENSING DEVICES

James E. Nicholson, Lincoln, and Lawrence Milesky, Needham, both of Mass., assignors to Codman and Shurtleff, Inc., Randolph, Mass.

Filed Apr. 20, 1979, Ser. No. 31,705
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—748 **16 Claims**



1. A pressure monitoring system comprising:
pump means for supplying fluid under pressure to a pump output;
switching means for controlling the supply of fluid from said pump means output responsive to the pressure level being monitored said switching means adapted to terminate the supply of fluid from said output when the pressure of said supplied fluid to said output is substantially equal to the pressure being monitored and thereafter to vent said supplied fluid to atmospheric pressure levels so that said pressure being monitored exceeds the pressure level at said output, said switching means adapted to cyclically repeat said supply of fluid to said output after each such venting occurs;
a measuring element to detect the pressure level of said supply fluid; and
a display meter for numerically displaying the analogous maximum detected pressure level of said supply fluid for a short period of time commencing at each instant when said supply of fluid to said output is terminated,
a second outlet for said pump;
selection means having portions corresponding to each of said outlets for preselecting a position for which said switching means, said measuring element and said display meter are connected to one of said pump outputs at a time;
said selection means including an automatic position, which, when selected, connects said pump means, switching means, said measuring element and said display meter to one output for a short period of time and sequentially connects the remaining output in the same fashion, and then reconnects the first output to cyclically repeat said sequence.

4,312,362

SINGLE SAMPLE NEEDLE WITH VEIN ENTRY INDICATOR

Joseph Kaufman, Emerson, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Oct. 2, 1980, Ser. No. 193,054
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—763 **22 Claims**

1. A single sample needle assembly for determining vein

entry when collecting a blood sample from a patient into an evacuated container comprising:

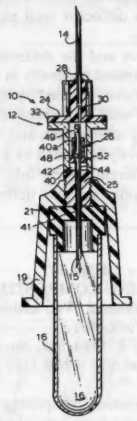
a housing having a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber can be viewed by a user of said assembly;

a first access opening through the forward end of said housing in fluid communication with said chamber;

a first cannula extending outwardly from said first access opening in fluid communication with said chamber adapted for insertion into a patient;

a second access opening through the rearward end of said housing in fluid communication with said chamber;

a second cannula in fluid communication with said second access opening extending inwardly into said chamber with a closed end and a pair of spaced side holes therethrough; and



a plug of air-permeable, blood-impermeable material in liquid-tight but slidable contact with said housing surrounding said chamber and said second cannula, said plug initially overlying the side hole more distal to said second access opening while leaving the other side hole uncovered in said chamber whereby blood, but not air, flowing into said chamber from said first cannula under normal tourniquet pressure is prevented by said plug from flowing into said second cannula but can be viewed by a user through said translucent housing to indicate vein entry by said first cannula, said plug adapted to slide under the influence of a negative pressure gradient applied to said second access opening to thereby uncover said distal side hole whereby blood may flow into said chamber, through said distal side hole and through said second cannula for collection out of said second access opening.

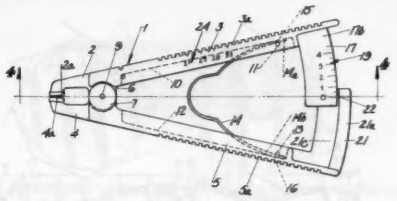
4,312,363

SURGICAL TISSUE THICKNESS MEASURING INSTRUMENT

Robert G. Rothfuss, Bellevue, Ky., and Edwin L. Stith, Jr., Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Feb. 26, 1980, Ser. No. 124,955
Int. Cl.³ A61B 5/10
U.S. Cl. 128—774 **6 Claims**

1. A pliers-like tissue thickness measuring instrument for surgical purpose comprising a pair of first and second opposed tissue engaging jaws, first and second elongated handles pivotally joined together, said first handle terminating in said first jaw and said second handle terminating in said second jaw, said handles being so configured as to shift said first and second jaws away from each other over a predetermined working range of separation distance between said first and second jaws when said handles are pivoted toward each other, resilient means to urge said first and second jaws toward each other with a substantially constant predetermined force throughout said working range, a pair of arcuate members extending from the free end of said first handle in side-by-side parallel spaced relationship toward the free end of said second handle, a single arcuate member extending from said free end of said second handle toward said free end of said first handle, said single



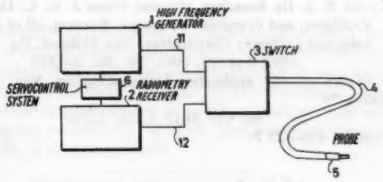
arcuate member having a first portion slidable between said pair of arcuate members of said first handle and a second portion slidable along those edges of said pair of members furthest from said jaws when said handles are shifted toward and away from each other to shift said jaws away from and toward each other, each of said pair of members bearing a scale representing said working range, said second portion of said single member having a pair of indicators each cooperating with one of said scales to give a direct reading of distance between said first and second jaws.

4,312,364

APPARATUS FOR LOCALIZED HEATING OF A LIVING TISSUE, USING ELECTROMAGNETIC WAVES OF ULTRA HIGH FREQUENCY, FOR MEDICAL APPLICATIONS

Guy Convert; Félix Diamand; Jacques Dufour, all of Buc, and Jean-Paul Le Bourgeois, Paris, all of France, assignors to C.G.R. MeV, Buc, France

Filed Apr. 5, 1978, Ser. No. 893,814
Claims priority, application France, Apr. 8, 1977, 77 10756
Int. Cl.³ A61N 1/40
U.S. Cl. 128—804 **10 Claims**

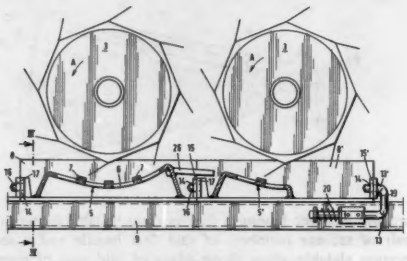


1. An apparatus for localized heating of living tissues, using electromagnetic waves of ultra-high frequency comprising an ultra-high frequency generator, a transmission line having one end connected to said ultra-high frequency generator, a switch with two inputs and one output, one input being connected to another end of said transmission line, a probe connected to the output of said switch, said probe capable of emitting said ultra-high frequency waves and designed for being introduced into living tissues to be heated, and radiometric means for monitoring the temperature of said living tissues in contact with said probe, said radiometric means comprising a radiometry receiver connected to the other input of said switch, said receiver capable of measuring the electromagnetic radiation re-emitted by said living tissues and picked up by said probe.

4,312,365
HARVESTER THRESHER

Helmut Claas, and Franz Tophinke, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,582
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923022
Int. Cl.³ A01F *7/04, 12/28*
U.S. Cl. 130—27 P **24 Claims**

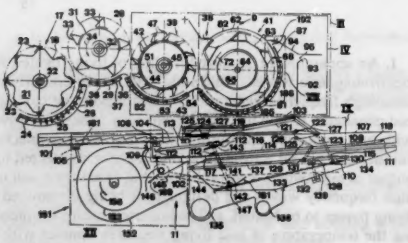


1. A harvester thresher, comprising
threshing means;
a plurality of separating means arranged adjacent to one another in direction of transportation and each including a separating drum having an axis and a separating element located below said drum, each of said separating elements including a perforated trough-shaped sheet member and a plurality of rubbing projections arranged on said sheet member and extending parallel to said axes;
means for laterally limiting each of said separating elements and including a plurality of pairs of lateral wall members, each of said pairs of lateral wall members laterally limiting and holding a respective one of said separating elements;
means for supporting said lateral wall members and including a bar-shaped elongated supporting element extending in the direction of transportation, said separating elements being arranged on and shiftable over said supporting element as units.

4,312,366
COMBINE HARVESTER

Cyriel R. J. De Busscher, Damme; Frans J. G. C. De Coene, Zedelgem, and Francois Van Herpe, Houtem, all of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 13, 1980, Ser. No. 206,608
Claims priority, application United Kingdom, Nov. 14, 1979, 39371/79
Int. Cl.³ A01F *12/00, 12/54*
U.S. Cl. 130—27 P **57 Claims**



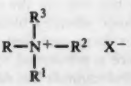
1. A combine harvester supported by a main chassis and comprising:
a separating mechanism having a separating rotor cooperable with a separator housing including a separator concave and arranged spirally to convey crop material to at least one end thereof while submitting said crop material to a separating action;
further crop treating means disposed below the separating mechanism for further handling separated grain;
means defining together with the separator concave and open ended cavity having its open end facing to the further crop treating means for leading grain separated through said separator concave to said further crop treating means;
an air inlet in the means defining the cavity at the upper portion thereof;
the further crop treating means are formed by a grain cleaning mechanism;
the means defining together with the separator concave said cavity comprise a deflector wall mounted at a distance from said concave;
the separator concave and the deflector wall defining said cavity are both oriented generally in an upright direction;
the open end of the cavity formed by the separator concave and the deflector wall is positioned at a short distance above the cleaning mechanism; and
the top end of the cavity is formed by a shielding member of the chassis and wherein said air inlet is provided between said shielding member and said deflector wall.

4,312,367
SMOKING COMPOSITIONS

Jeffrey I. Seeman, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed May 8, 1980, Ser. No. 147,895
Int. Cl.³ A24B *3/12*
U.S. Cl. 131—276 **30 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.001 and 5 weight percent, based on the total weight of filler, of a quaternary ammonium additive compound corresponding to the formula:



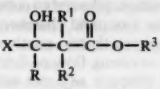
wherein R, R^1, R^2 and R^3 individually are selected from aliphatic, alicyclic and aromatic radicals containing between 1 and about 8 carbon atoms; R and R^1 when taken together with connecting elements form a heteroalicyclic structure, and R, R^1 and R^2 when taken together with connecting elements form a heteroaromatic structure; and X is an organic acid anion.

4,312,368
SMOKING COMPOSITIONS

Yoram Houminer, Richmond, and Harvey J. Grubbs, Mechanicsville, both of Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Feb. 20, 1980, Ser. No. 122,901
Int. Cl.³ A24B *3/12, 3/36, 3/38, 3/40*
U.S. Cl. 131—277 **5 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.00001 and 2 weight percent, based on the total weight of filler, of a heterocyclic-hydroxy-substituted carboxylate compound corresponding to the formula:



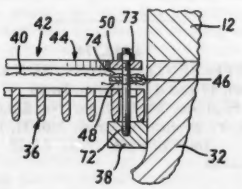
wherein X is a heterocyclic substituent containing between about 2–12 carbon atoms, and any heteroatom in X is selected from oxygen, nitrogen, and sulfur; R is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms; R^1 and R^2 are hydrogen or substituents selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms, and R^1 and R^2 when taken together with connecting elements form an alicyclic structure; and R^3 is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms.

4,312,369

SCREEN HOLDING APPARATUS IN A LIQUID CRYOGEN PRESSURE VESSEL

Thomas W. Mullen, III, Richmond; Richard M. Hultz, Mechanicsville, both of Va., and Thomas O. Turner, Midland, N.C., assignors to Philip Morris, Inc., New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,521
Int. Cl.³ A24B *3/18*
U.S. Cl. 131—290 **6 Claims**



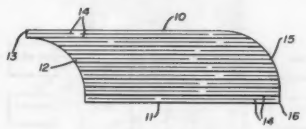
6. In a pressure vessel of the type used for impregnating tobacco with liquid carbon dioxide and converting the liquid carbon dioxide impregnating said tobacco to solid carbon dioxide therein, said vessel including means for introducing tobacco to be impregnated and means for withdrawing solid carbon dioxide containing tobacco, wherein said withdrawal means includes a door pivotally hinged to open to permit gravitational discharge of the impregnated tobacco from said vessel, said door including a substantially circular grating to support said tobacco in said vessel when said door is closed and being supported by a shoulder formed radially internally of said door, a circular wire mesh screen having a diameter greater than the diameter of said grating to permit passage therethrough of gaseous and liquid carbon dioxide while substantially preventing tobacco from passing therethrough, wherein the improvement comprises means for securely holding said wire mesh screen fixed relative to said grating at a location proximate the periphery of said screen and at a location interiorly of the periphery of said screen to minimize stretching and tearing thereof during discharge of said impregnated tobacco, the periphery of said screen being folded around and beneath a retention ring having an outer diameter approximately the same as the diameter of the grating, a grid on said screen, said grid including an outer ring portion having a diameter approximately the same as the diameter of said retention ring and a plurality of strips angularly joined interiorly of said peripheral portion; and means for securing said grid to said door such that the folded peripheral portion of the screen is held between the retention ring and the grating, the outer radial unfolded portion of the screen is held between the outer ring portion of said grid and the retention ring and the interior surface portion of said screen is held between said joined strips and said grating.

4,312,370

TOOTHPICK

George Hinge, 621 Jacobs Rd., Youngstown, Ohio 44505

Filed May 13, 1980, Ser. No. 149,508
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—93 **6 Claims**



1. A toothpick comprising an elongated section of thin semi-rigid plastic material, the width of which is approximately one-fourth the length thereof, longitudinally extending closely spaced corrugations formed in said plastic material and at least one end of said toothpick being curved from a point adjacent one of its longitudinal edges to a point inwardly of the opposite longitudinal edges so as to define a projecting point into which at least one of the longitudinal corrugations extends.

4,312,371

UMBRELLAS

Tan C. Koon, 768 Block 125 Margaret Dr., Singapore 3, Singapore

Filed Jun. 20, 1979, Ser. No. 50,417
Int. Cl.³ A45B *11/00, 15/00*
U.S. Cl. 135—19.5 **6 Claims**

1. An umbrella comprising a resilient one-piece ring, a cover made of flexible material, and a handle having first and second ends, wherein said cover is attached adjacent its periphery to said resilient one-piece ring and said first and second ends of said handle are connected to said resilient one-piece ring and to said cover, respectively, whereby said handle supports said umbrella in its erect position.

4,312,372

FLUID HANDLING SYSTEMS AND MULTI-POSITIONABLE VALVE ARRANGEMENTS FOR USE THEREIN

Benton H. Amos, 2427 Vista Dr., Bellingham, Wash. 98225, and William M. Wood, 231 N. State St., Bellingham, Wash. 98295

Continuation-in-part of Ser. No. 40,145, May 18, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,069
Int. Cl.³ F16K *11/02, 11/22*
U.S. Cl. 137—266 **37 Claims**

1. A fluid handling system for transferring fluids between n (where "n" is any whole integer greater than "1") fluid source means and m (where "m" is any whole integer greater than "1") fluid utilization means comprising, in combination:

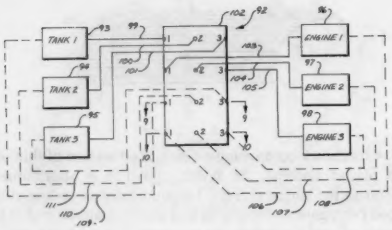
(a) valve housing means having n fluid source supply inlet ports, n fluid source return outlet ports, m fluid utilization

supply outlet ports, and m fluid utilization return inlet ports;

(b) means for connecting said n fluid source supply inlet ports and said n fluid source return outlet ports to respective different ones of said n fluid source means;

(c) means for connecting said m fluid utilization supply outlet ports and said m fluid utilization return inlet ports to respective different ones of said m fluid utilization means;

(d) selectively positionable valve control element means mounted in said valve housing means, said valve control element means having (i) fluid supply passageway means



for selectively connecting one of said n fluid source supply inlet ports with said m fluid utilization supply outlet ports and (ii) fluid return passageway means for selectively connecting said m fluid utilization return inlet ports with one of said n fluid supply return outlet ports; and,

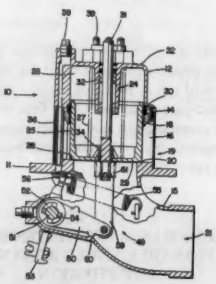
(e) means for selectively positioning said valve control element means in any one of at least n positions wherein any one of said n fluid supply means is operatively connected to supply fluid to said m fluid utilization means and said m fluid utilization means are operatively connected to return fluid to any one of said n fluid supply means.

4,312,373

INTERNAL VALVE

Basil B. Tilling, Mission Viejo, and Henry A. Swindler, Tustin, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 24, 1980, Ser. No. 133,035
Int. Cl.³ F15C *1/14*
U.S. Cl. 137—393 **8 Claims**



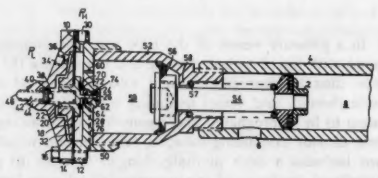
1. An internal valve for filling tank trucks and the like through an aperture in a bottom partition of the tank, comprising a valve housing having inlet and outlet ports therein, a valve seat in said housing disposed between said inlet and outlet ports for controlling fluid flow therethrough, a chamber in said housing, a piston slidable in said chamber in response to fluid pressure therein toward and away from said valve seat for closing and opening communication between said inlet and outlet ports, said piston having an aperture in the head thereof providing a path for fluid flow from said inlet port to said chamber to build-up fluid pressure in said chamber to urge said piston to its close position, pilot valve means in said housing for controlling fluid flow from said chamber, thereby controlling the position of said piston therein relative to said valve seat, a flow restrictor for restricting flow of fluid through said piston aperture when said piston is adjacent said valve seat to slow the rate of closure for gently seating said piston on said valve seat, an actuator member disposed in said piston aperture extending from said inlet port to a location external of said housing for cooperation with a tank vent valve for relieving pressure within the tank, means for limiting movement of said actuator member at a predetermined rest location, a lost motion connection between said piston and said actuator member providing limited relative movement therebetween, said flow restrictor being mounted on said actuator member for movement therewith and to be positioned at a predetermined location when said actuator member is in the rest location to cooperate with said piston to restrict fluid flow through said piston orifice, said actuator member comprising a rod journalled in said housing for reciprocatory movement in said piston aperture, said flow restrictor comprising a projection on said actuator member adapted to be closely received in said piston aperture as said piston descends toward seating engagement with said valve seat to form a restricted orifice for limiting fluid flow in said chamber, said lost motion connection between said piston and actuator member comprising first and second abutment members on said actuator rod positioned on opposite sides of an intermediate portion of said piston so as to engage said piston portion at the opposite ends of relative travel therebetween.

4,312,374

DIFFERENTIAL-PRESSURE VALVE

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Jan. 24, 1980, Ser. No. 114,894
Claims priority, application Israel, Jan. 31, 1979, 56550
Int. Cl.³ F16K *17/32, 17/22*
U.S. Cl. 137—469 **11 Claims**



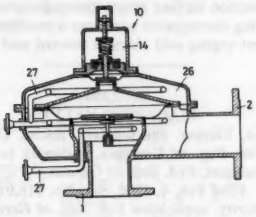
1. A differential-line pressure valve including a valve passageway formed through a fixed wall and closable by a valve member displaceable by a differential-line pressure sensor biased to close the valve passageway and having its opposite faces subjected to the differential-line pressure such that the higher pressure applied to one face of the sensor tends to open the valve passageway and the lower pressure applied to the opposite face of the sensor tends to close the valve passageway, characterized in that the high-pressure face of the sensor has fixed thereto the valve member movable to open and close said passageway, and also has fixed thereto an annular sealing surface circumscribing the valve member, such that when the sensor is in its valve-closed position, the annular sealing surface seals off the portion of the high-pressure face of the sensor circumscribing said valve member from the high-pressure thereby increasing the differential-line pressure required to actuate the sensor to open the valve passageway, and when the sensor is in its valve-open position the annular sealing surface exposes said portion of the high-pressure face of the sensor to the high-pressure thereby decreasing the differential-line pressure required to actuate the sensor to close the valve passageway.

4,312,375

PILOT CONTROLLED MEMBRANE VALVE

Hubert Leinemann, Brunswick, Fed. Rep. of Germany, assignor to Braunschweiger Flammenfilter Leinemann & Co., Brunswick, Fed. Rep. of Germany

Division of Ser. No. 760,950, Jan. 21, 1977, Pat. No. 4,148,336.
This application Dec. 21, 1978, Ser. No. 971,875
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605015
Int. Cl.³ F16K *31/365*
U.S. Cl. 137—489 6 Claims



1. A pilot controlled membrane valve for ventilating containers or the like connected thereto, comprising a valve housing having an inlet and an outlet; a first valve seat in said housing between said inlet and said outlet; first valve means movable between a closed position engaging said first valve seat and an open position and including a membrane extending transversely through said housing and defining with the latter a valve chamber at one side of said first valve seat; a valve disk connected to a central portion of said first membrane and having a diameter smaller than that of said first valve seat; overpressure passage means connecting said valve chamber with said inlet; a pilot valve having a second valve seat in communication with said valve chamber, second valve means including a second membrane and movable between a closed position engaging said second valve seat and an open position, a second outlet for said pilot valve, means biasing said second valve means to said closed position, and chamber means under atmospheric pressure surrounding said biasing means and separated from said second outlet by said second membrane; a support against which said valve disk abuts in said closed position of said first valve means; and means to adjust the vertical position of said support relative to said first valve seat.

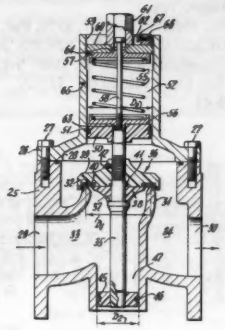
4,312,376

PRESSURE-SUSTAINING VALVE

Walter E. Allen, Prospect, Conn., assignor to Transamerica DeLaval Inc., Princeton, N.J.

Filed May 23, 1980, Ser. No. 152,544
Int. Cl.³ F16K *15/06*
U.S. Cl. 137—494 10 Claims

1. A piston-valve construction, comprising a valve body with a passage communicating between inlet and outlet ports, an interior bridge dividing the space between said ports into an inlet chamber and an outlet chamber, said bridge having an opening defining a circular valve-member seat of first effective diameter, an elongate valve stem extending normal to the circle of said seat and centrally therethrough, a valve member carried by said stem and positionable to open or close the valve in accordance with stem-guided displacement with respect to said seat, a first piston on that end of said stem which extends into said inlet chamber, first cylindrical guide means carried by said body for said first piston and extending coaxially with the stem axis, a second piston on that end of said stem which extends into said outlet chamber, second cylindrical guide means carried by said body for said second piston and extending coaxially with the stem axis, seal means associated with each piston for sealing the same against fluid flow from the associated one of said chambers, the sealed area of said first piston being less than the effective area of said seat and the sealed area of said second piston being substantially the same as the effective area of said seat, and stem-loading means continuously urging said valve member in the direction of seat engagement.

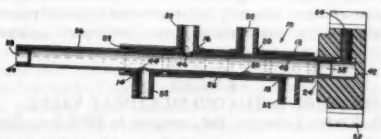


4,312,377

TUBULAR VALVE DEVICE AND METHOD OF ASSEMBLY

Helmut Knecht, Clark, N.J., assignor to Teledyne Adams, a Division of Teledyne Isotopes, Inc., Union, N.J.

Filed Aug. 29, 1979, Ser. No. 70,690
Int. Cl.³ F16K *11/085*
U.S. Cl. 137—625.19 7 Claims



1. A tubular valve comprising:

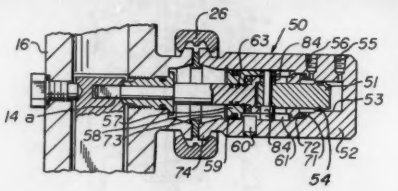
an outer shell open at both ends and having a first pair of ports on opposing surfaces,

a first pair of deformable resilient valve sealing means having a main hollow cylindrical section with a longitudinal passage and a lateral tubular extension with a secondary passages, said main cylindrical sections fitting closely within said shell with said lateral extension projecting outwardly through respective ports, and an inner transfer tube including closing means positioned at opposite ends of said inner transfer tube to enclose and seal said ends extending coaxially through and being rotatable within said outer tubular shell and longitudinal passages of said valve sealing means, said tube including a first pair of openings on opposing surfaces, said openings being positioned for selective rotation into and out of alignment with said ports, said valve sealing means filling and sealing the space between said inner tube and outer shell in the area around said opening and ports, said tube providing communication for fluids between said pairs of ports and openings upon rotation into alignment in a first open position and preventing communication there between upon rotation out of alignment in a closed position.

4,312,378
TOOL DIVERTER

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 104,288, Dec. 17, 1979, Pat. No. 4,252,149, which is a continuation of Ser. No. 929,365, Jul. 31, 1973, abandoned. This application Oct. 15, 1980, Ser. No. 197,045
Int. Cl.³ F16K *11/02, 31/122*
U.S. Cl. 137—625.44 4 Claims



2. In a connector for joining a main flowline to a branch flowline, having a diverter member pivotally mounted within said connector on an operating shaft extending from said connector, and said operating shaft rotatable by an external actuator mounted on said connector, said external actuator comprising:

a. a housing releasably mounted on said connector, said housing containing a hydraulic chamber;

b. a piston disposed within said hydraulic chamber and sealing said chamber into two variable capacity zones;

c. means for communicating hydraulic fluid to and from each zone;

d. a cam cylinder connected to said operating shaft and rotatably mounted within said housing;

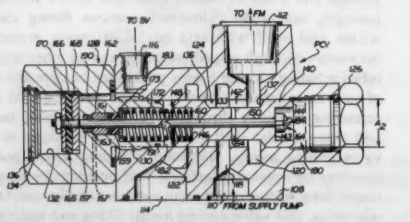
e. a guide cylinder installed between said housing and said cam cylinder to prevent rotational movement of said guide cylinder;

f. a wrist pin joining said piston and said cam cylinder, said wrist pin extending through helical openings in opposite sides of said cam cylinder, and opposite ends of said wrist pin engaging in a longitudinal slot in opposite sides of said guide cylinder, whereby linear movement of said piston is translated into rotary movement of said operating shaft.

4,312,379
PRESSURE ACTUATED MULTIWAY VALVE

Mark R. Kinder, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 878,564, Feb. 16, 1978, Pat. No. 4,223,646. This application May 23, 1980, Ser. No. 152,550
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—625.48 9 Claims

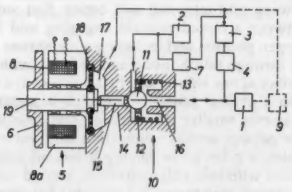


1. Apparatus for controlling fluid flow in a hydraulic system: said apparatus comprising a housing having an axially extending bore, an inlet port, an outlet port, a pilot port and a bypass port; a valve element movable in said bore for controlling fluid flow between said inlet port, said outlet port and said bypass port; a pilot fluid pressure actuated device connected with said valve element for moving said valve element in one axial direction and a spring for moving said valve element in the opposite axial direction; said pilot pressure actuated device being in fluid communication with said pilot port; said valve element being axially movable in opposite directions between a first position establishing predetermined flow paths between said inlet port said outlet port and said bypass port, and a second position establishing at least a predetermined flow path between said inlet port and said outlet port; fluid reaction surface means connected with said valve element and disposed in fluid communication with fluid flowing through said valve element, said fluid reaction surface means being designed so that fluid pressure acting thereagainst produces a resultant force on said valve element urging said element toward said first position.

4,312,380
MAGNETIC VALVE

Heinz Leiber, Leimen, and Günter Piesche, Ubstadt-Weiher, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 4, 1980, Ser. No. 118,015
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909504
Int. Cl.³ F16K *31/06*
U.S. Cl. 137—627.5 5 Claims



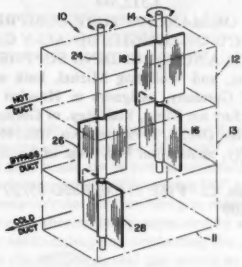
1. A magnetic valve including a housing and an electromagnet having an armature and housed in a chamber in said housing which is not infiltrated by the pressure medium to be controlled, a valve closure body inserted between a pressure source and a pressure consumer, a rod coupling disposed between the armature of the electromagnet and the closure body of the valve, a membrane secured to said rod coupling and to said valve housing, a sealing apparatus for sealing the entryway of the rod coupling into the region infiltrated by pressure medium, a high-pressure chamber arranged to be connected with a source of relatively high pressure and an intermediate-pressure chamber located between said high-pressure chamber and said electromagnet, a low-pressure chamber subjected to relatively low pressure, said intermediate-pressure chamber communicating with said low-pressure chamber, a wall having a passageway opening between said high pressure chamber and said intermediate-pressure chamber, said rod coupling passing through said passageway opening, said passageway opening being so dimensioned that, first, on the one hand, a flow of pressure medium arises from said high-pressure chamber to said low-pressure chamber along the rod coupling while on the other hand, the pressure drop at said passageway opening between said high-pressure chamber and said intermediate pressure chamber constitutes by far the greatest share of the pressure difference between said high-pressure chamber and said low-pressure chamber, characterized in that said valve has a further connection, through which said consumer is connectable with said low-pressure chamber, that the rod coupling is effective to displace a slider valve, which in one position connects said consumer with said low-pressure chamber, in a second position breaks this connection, and in a third position connects the high-pressure chamber to said consumer, and that the valve is controllable as a result into two different energized positions, that from the outset position up to the attainment of

an intermediate position one restoring spring force is exerted upon said slider valve and from the attainment of the intermediate position up to the attainment of the final position a greater restoring spring force is exerted upon said slider valve and that the electromagnet can be subjected to varying electrical output in order to attain position control.

4,312,381
AIR FLOW DAMPING SYSTEM

David A. Ratner, Walnut Creek, Calif., assignor to Aladdin Heating Corporation, San Leandro, Calif.

Filed Mar. 27, 1980, Ser. No. 134,458
Int. Cl.³ F16K *11/18*
U.S. Cl. 137—636 **7 Claims**



1. In a triple-plenum air conditioning apparatus having a by-pass air duct, a hot air duct, and a cold air duct, the improvement comprising:

(a) a first shaft mounted through said by-pass air duct and said hot air duct for rotation about its axis;

(b) a first generally planar by-pass air damper blade rigidly mounted on said first shaft within said by-pass air duct and adapted to close said by-pass air duct when positioned transversely of said by-pass air duct by said rotation of said first shaft;

(c) a generally planar hot air damper blade rigidly mounted on said first shaft within said hot air duct at right angles to said by-pass air damper blade and adapted to close said hot air duct when positioned transversely of said hot air duct by said rotation of said first shaft;

(d) a second shaft in spaced relation to said first shaft mounted through said by-pass air duct and said cold air duct for rotation about its axis;

(e) a second generally planar by-pass air damper blade rigidly mounted on said second shaft within said by-pass air duct and adapted to close said by-pass air duct when positioned transversely of said by-pass air duct by said rotation of said second shaft;

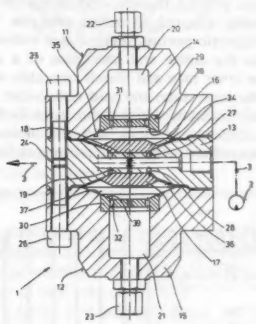
(f) a generally planar cold air damper blade rigidly mounted on said second shaft within said cold air duct at right angles to said by-pass air damper blade and adapted to close said cold air duct when positioned transversely of said cold air duct by said rotation of said second shaft; and

(g) a common control device external of said by-pass air, hot air and cold air ducts for rotating both said first shaft and said second shaft independently of each other and for holding each of said first shaft and said second shaft against rotation when not being rotated by said common control device for rotating said first shaft and said second shaft independently of each other, said common control device including a first geneva link comprising a plate having an open ended slot therein mounted on the projecting end of said first shaft transverse of its axis with said slot extending radially of said first shaft, a second geneva link comprising a plate having an open ended slot therein mounted on the projecting end of said second shaft transversely of its axis in generally planar alignment with said first geneva link with said slot extending radially of said second shaft, a third shaft mounted for rotation about its axis extending in parallel equal spaced relation between said first and second shafts, a drive plate mounted on said third shaft for rotation by said third shaft with a surface thereof in overlapping generally parallel relation to corresponding surfaces of said first and second geneva links, and a pair of drive pins projecting from said surface of said drive plate each engaging the open end of the slot in a different one of said first and second geneva links and being dimensioned to be received in said slot.

4,312,382
PRESSURE PEAK COMPENSATOR FOR PULSATING STREAMS OF LIQUID

Gerhard Gebauer, Bermatingen, Fed. Rep. of Germany, assignor to Firma J. Wagner GmbH, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,876
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2910025
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **12 Claims**



1. A pressure peak compensator for connection to a pressure liquid line, comprising first and second accumulators each having a respective first and second pressure chamber connectable to the liquid line, respective first and second diaphragms extending transversely across said respective first and second pressure chambers and each having a first side and an opposite second side exposed to the liquid pressure in said pressure chamber, each of said diaphragms being movable between two end positions upon variation in pressure in said respective pressure chambers, each of said first and second accumulators having a gas chamber defined therein exposed to said first side of the associated first and second diaphragms, backing means in each accumulator for backing substantially the entire area of each of said diaphragms in each of their end positions, said first and second diaphragms being movable in response to variations in pressure in the pressure liquid line to compensate for peak pressures therein.

4,312,383
HOSE CONSTRUCTION AND APPARATUS FOR AND METHOD OF MAKING SAME

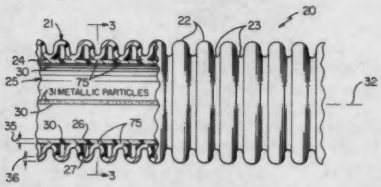
Donald L. Kleykamp, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 21, 1980, Ser. No. 141,839
Int. Cl.³ F16L *11/11*; B29C *27/04*
U.S. Cl. 138—103 **23 Claims**

1. In a hose construction comprising a corrugated outer tube made of polymeric material and having alternating projections and recesses with said recesses having inwardly facing convex surfaces and an inner tube made primarily of polymeric material and having smooth inside and outside surfaces with said outside surface being bonded against said convex surfaces, the improvement in which said inner tube has at least one longitu-

dinally extending polymeric portion comprising same which has electrically conductive particles embedded therein and serving as a matrix for said particles, said one polymeric portion being a ribbon-like portion provided as an integral part of said inner tube and defining the entire wall thickness of a corresponding portion of said inner tube, and said one polymeric portion being heat fused to said convex surfaces after having been heat fused thereto through the use of said particles.

12. In an apparatus for making a corrugated smooth bore hose construction comprising; means for forming a corrugated outer tube made of a polymeric material and having alternating projections and recesses with said recesses having inwardly facing convex surfaces; means for forming an inner tube made primarily of polymeric material and having smooth inside and outside surfaces; means for disposing said inner tube within said outer tube; and means for bonding said outside surface of said inner tube against said convex surfaces; the improvement in which; said means for forming said inner tube comprises means for forming said inner tube with at least one longitudinally extending polymeric portion provided as an integral part thereof and having electrically conductive particles embedded in a matrix-like portion thereof; said means for forming said inner tube being adapted to define said one longitudinally extending polymeric portion thereof as a ribbon-like portion which defines the entire wall thickness of a corresponding portion of the inner tube and blends smoothly with adjoining portions of the inner tube and said ribbon-like portion has a particular wall thickness which is the same as the wall thickness of said adjoining portions, and said means for bonding comprises, means for urging said inner tube radially to thereby



urge said polymeric portion against said convex surfaces, and electrical induction coil means for disposition concentrically around said corrugated outer tube so that with said polymeric portion urged against said convex surfaces said induction coil means provides heating of said electrically conductive particles causing partial melting of parts of said outer tube which define said convex surfaces as well as partial melting of said matrix-like portion; said partially molten parts and matrix-like portion self-bonding upon cooling thereof.

19. In a method of making a corrugated-smooth bore hose construction comprising the steps of; forming a corrugated outer tube of a polymeric material and having alternating projections and recesses with said recesses having inwardly facing convex surfaces; forming an inner tube primarily of a polymeric material and having smooth inside and outside surfaces; disposing said inner tube within said outer tube; and bonding said outside surface of said inner tube against said convex surfaces; the improvement in which; said step of forming said inner tube comprises forming said inner tube with at least one longitudinally extending polymeric portion provided as an integral part thereof and having electrically conductive particles embedded in a matrix-like portion thereof; said step of forming said inner tube with said one longitudinally extending polymeric portion comprises forming said inner tube with said polymeric portion as a ribbon-like portion which defines the entire wall thickness of a corresponding portion of the inner tube and blends smoothly with adjoining portions of the inner tube and said ribbon-like portion has a particular wall thickness which is the same as the wall thickness of said adjoining portions, and said bonding step comprises the steps of, urging said inner tube radially to thereby urge said polymeric portion against said convex surfaces, and moving said corrugated outer tube with said inner tube disposed therewithin and with said polymeric portion urged against said convex surfaces through an electrical induction coil to thereby heat said electrically conductive particles and cause partial melting of parts of said outer tube which define said convex surfaces as well as partial melting of said matrix-like portion; and cooling said partially molten parts and matrix-like portion to self-bond same.

4,312,384

ARTICLE OF MANUFACTURE COMPRISING A HOLLOW ROD OF LONGITUDINALLY GATHERED TUBING WITH A SURROUNDING SUPPORT SHEATH

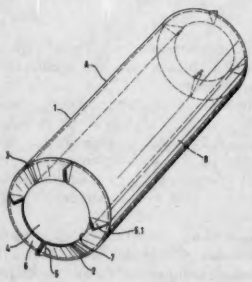
Reinhold Becker, and Wolfgang Michel, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,746

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853401

Int. Cl.³ F16L *11/00*; B65D *85/20*

U.S. Cl. 138—109 **4 Claims**

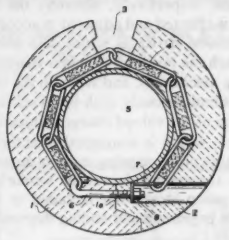


1. An article of manufacture comprising a one-piece container-like, hollow cylindrical support sheath and an open-ended hollow rod of longitudinally gathered, cellulose hydrate tubing disposed in the interior of said support sheath with the support sheath surrounding said hollow rod while leaving the open end of the hollow rod free; said hollow rod constituting a formed, but unutilized, sausage casing; said support sheath being made from a formable, flexible sheet of fusible, thermoplastic polymer material and being disposed around said hollow rod with the length of said sheath being such that the ends of the sheath project beyond the ends of the hollow rod; at least two outwardly projecting, permanently shaped, stable folds being formed in each of the projecting ends of said sheath with said folds being disposed radially with respect to the center of said sheath whereby the inside diameters of the projecting ends of said sheath are partially narrowed to form integral sheath end walls with an opening in each end wall, the sides of said folds being fused together to make the folds permanent whereby outwardly projecting, double layer, triangular flaps of sheet material are produced adjacent the fused seams, each flap having an open end and a folded edge forming an angle with the fused seam; said flaps being folded down around the fused seams as a folding axis against the sheath end walls and firmly fused to said end walls; said end walls ensuring that the shape and position of the hollow rod in the interior of the support sheath are fixed when the hollow rod is soaked in water or moistened.

4,312,385
REFRACTORY INSULATION FOR COOLING PIPES IN REHEATING FURNACES

Matthias Magera, Cosa Mesa, Calif.

Filed Jan. 31, 1980, Ser. No. 117,264
Int. Cl.[3] F16L 9/22; F27D 3/02
U.S. Cl. 138—149 2 Claims

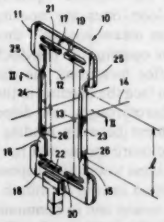


1. For use in combination with a water flowing pipe, a refractory insulating sleeve of less than 360° substantially surrounding said pipe made up of two substantially semi-circular refractory insulating sleeves of less than 180° each, two of the ends of said semi-circular sleeves being in mating relationship, the other two ends thereof being separated by a gap, a metallic wire mesh for surrounding and contacting the outer surface of said pipe with the portion in said gap acting as a pivot for said substantially semi-circular sleeves, said gap being devoid of any material interfering with the free pivotal movement of said pivot portion of said wire mesh to allow separation from said water flowing pipe, the other two ends of said refractory insulating sleeves being mated together, readily detachable fastening means embedded in the other two end portions for holding together end portions of said wire mesh and for prestressing said wire mesh.

4,312,386
HARNESS FRAME FOR LOOMS

Kihei Takahashi; Seiko Terada, both of Uozu, and Muchiji Shimono, Namerikawa, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 90,996
Claims priority, application Japan, Nov. 20, 1978, 53-159749[U]
Int. Cl.[3] D03C 9/06
U.S. Cl. 139—92 5 Claims



1. A unitary harness frame of sheet metal for looms employing warp threads, comprising:

(a) a pair of integrally joined parallel spaced vertical outermost side members, each having flat portions lying in a common plane; and

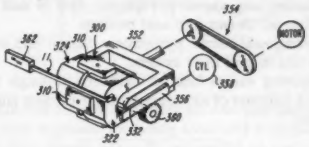
(b) a pair of heddle-support bars extending perpendicularly as cantilevers in said plane from at least one of said vertical side members;

(c) at least one of said vertical side members having a further flat portion between said pair of heddle support bars which, in horizontal cross section, extends at a right angle to said plane, the thickness of said further portion being that of said first-named flat portions, whereby said one vertical side member may be disposed between warp threads in a loom.

4,312,387
APPARATUS FOR MAKING DYNAMOELECTRIC FIELD MEMBER

Hyman B. Finegold, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Continuation of Ser. No. 971,631, Dec. 21, 1978, abandoned, which is a division of Ser. No. 736,880, Oct. 29, 1976, Pat. No. 4,131,988. This application Apr. 28, 1980, Ser. No. 144,280
Int. Cl.[3] B21F 3/04
U.S. Cl. 140—92.2 12 Claims



1. Apparatus for manufacturing dynamoelectric windings having plural coils, comprising:

a mandrel having a first axis and a plurality of core pieces spaced about said first axis;

means supporting said mandrel for rotation about said first axis;

means for guiding strapping from a source of strapping to a position adjacent said mandrel;

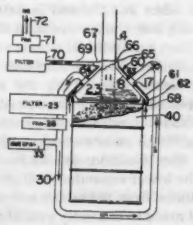
means for edge winding said strapping into edge wound coils about each of said core pieces; and

means for rotating said mandrel about said first axis for successively presenting each of said core pieces in position to have said strapping guided thereto for winding said coils and for forming continuous and uninterrupted connecting portions between the coils.

4,312,388
DUST CONTROL APPARATUS AND METHOD OF TRANSFERRING DUST LADEN DISCRETE SOLID PARTICLES

Charles C. Hager, Rte. 1, Box CF80, Crestwood, Ky. 40014; Warner Long, 9112 Tiverton Way, Louisville, Ky. 40223, and George T. Hempenstall, 11104 Berwick Pl., Middletown, Ky. 40243

Filed Feb. 12, 1980, Ser. No. 120,817
Int. Cl.[3] B65B 1/04
U.S. Cl. 141—1 19 Claims



19. A method of transferring dust laden discrete particles of highly pyrophoric materials, which comprises the steps of:

A. loading said pyrophoric material through a transfer hose to a container closed with a dust control hood;

B. establishing a plenum chamber between said hood and said container;

C. circulating an inert gas through plenum, out of said hood to a closed gas loop comprising in a series;

1. a filter;
2. a fan;
3. a source of make up gas;
4. and thence back to said hood.

D. collecting said pyrophoric dust in said filter beneath a blanket of inert gas:

the improvement which comprises:

E. providing a second plenum outside said dust control hood;

F. drawing ambient air through said plenum to an exhaust line;

G. drawing said air from said plenum through a second filter;

H. lifting said hood from said container when filled;

I. entraining any excess pyrophoric dust in said stream of ambient air drawn into said plenum;

J. oxidizing said excess pyrophoric dust in said second plenum and in said filter system;

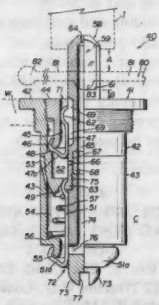
K. disipating excess heat of oxidation through the use of excess volumes of air throughout the plenum and filtration system.

4,312,389

VALVE MECHANISM OF ROLLING SEAL TYPE AND GAS LIGHTER VALVES USING THE SAME

Eiji Suzuki, 681-5 Oiso, Oiso-machi, Naka-gun, Kanagawa, Japan

Filed Jan. 14, 1980, Ser. No. 111,667
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—291 **17 Claims**



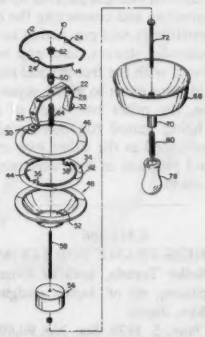
13. An injecting and charging valve of direct connection type for a gas lighter, comprising: a fastened outer cylinder including at least upper and lower cylinder portions mounted removably to each other and formed in between with a discharge passage having communication with the chamber of the tank of said gas lighter; a cylindrical nozzle member having its substantially lower half received in said outer cylinder, while being additionally biased upward by the action of biasing means, and its substantially upper half protruding upward from said outer cylinder and formed with an injection shoulder to be brought into contact with an actuating mechanism for effecting and adjusting the injection; an elastic tubular member coaxially fitted in the lower expanded wall of the axial through bore, which is expanded from the nozzle exit at the head of said nozzle member and made to coaxially extend downward therefrom in a communicating manner, thereby to provide a check valve mechanism for automatically interchanging the injecting and charging operations; an inner movable valve member of cylindrical shape loosely bearing the lower edge of said tubular member and connected to said nozzle member coaxially in a sealing manner; and a pair of rolling seal-type elastic flexible cover tubes having their respective inner and outer end sides fitted, respectively, between said outer cylinder and the upper and lower outer circumferences above and below the injection side wall, which is formed in the lower wall of said nozzle member while extending in the direction toward said check valve mechanism, thereby to provide a discharging stroke valve mechanism and an injecting, discharging and charging valve mechanism, respectively, whereby the injection from said nozzle exit is effected and adjusted in accordance with the beginning depression stroke in which said nozzle member is depressed through the injection shoulder thereof by the action of said actuating mechanism, and wherein the charging operation is effected simultaneously with the discharging operation by the depression of the valved charging injection port of said gas supply bomb, which is connected directly to said nozzle exit in a fluid-tight communicating manner during the charging operation, until the ending depression stroke exceeding said beginning depression stroke but included in the full stroke composed of the beginning and ending depression strokes.

4,312,390

DISPENSING DEVICE FOR COFFEE AND THE LIKE

Edward Plonski, 291 W. Washington St., Bristol, Conn. 06010

Filed Apr. 14, 1980, Ser. No. 140,219
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—380 **10 Claims**



1. A dispensing device for coffee and the like, said device comprising an attachment means for releasably securing the device to a container having a cylindrical opening, an inner closure means for the container opening connected with and supported in position over the opening by the attachment means, said closure means having a through opening aligned with the container opening for the discharge of coffee therefrom, a small coffee measuring the dispensing cup with its mouth arranged to face the opening in the closure means and to dispense coffee therethrough, said dispensing cup being supported for movement between loading and dispensing positions within said closure means and having associated biasing means urging the same toward its dispensing position, said cup in its loading position having its mouth defining edge spaced from said closure means and in communication with said container opening for the loading of coffee therefrom with the container inverted, and said cup in its dispensing position having its mouth defining edge in engagement with said closure adjacent the closure opening whereby to discharge coffee therewithin through the closure opening while preventing the inadvertent discharge of coffee from the container opening through said closure opening, an outer closure means releasably engageable in sealing relationship with a marginal portion of said inner closure means, and a dispensing cup actuator operatively associated with said outer closure means and manually operable from the exterior of said outer closure means to

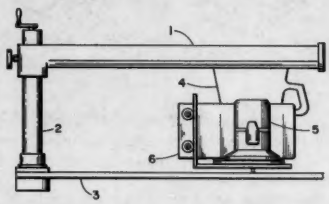
move said dispensing cup between its said loading and dispensing positions.

4,312,391

ROUTER ADAPTING FIXTURE FOR RADIAL ARM SAWS

Thomas D. Snow, 2256 Maxine Way, Rancho Cordova, Calif. 95670

Filed Jan. 23, 1978, Ser. No. 871,346
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—1 F 8 Claims



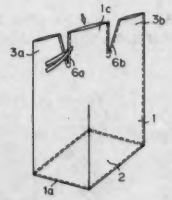
1. A router adapting fixture for radial arm saws, said radial arm saw including a motor having a housing and a shaft extending through an end bell of said housing as part thereof, said shaft connected to said motor and normally mounting a circular saw, said router adapting fixture comprising (a) means for mounting and attaching said router adapting fixture upon the shaft of said radial arm saw motor and means for attaching and securing said router adapting fixture to said motor housing of said radial arm saw motor, (b) means positioned on and perpendicularly of the shaft of said radial arm saw motor, said last named means supporting (c) means adapted to mount a router for lateral adjustment in a plane parallel to the axis of rotation of said radial arm saw motor shaft, (d) means for mounting and securing said router including means to receive the router bit of said router when said router is mounted on said fixture.

4,312,392

BAG AND PROCESS FOR MANUFACTURING THE SAME

Keiji Sekiguchi, Uozu, Japan, assignor to Toyama Industry Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,641
Int. Cl.³ B65D *33/06*
U.S. Cl. 150—3 13 Claims



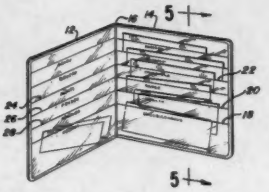
1. A bag comprising a bag body having a bottom and an upper portion with a top end extending from the upper portion, an opening formed in the top end and a hanging sling formed on the upper portion of the bag body, said top end including a cylindrical portion having the opening formed in the central part thereof and two projecting portions formed symmetrically on either side of the cylindrical portion, said projecting portions being closed, on the sides nearest the cylindrical portion, along seams which extend from both projecting portions to the edge of the opening of the cylindrical portion, and cloth flaps comprising the cylindrical portion being sewn along said seams, wherein said seams are located on a plane which passes through the central axis of the cylindrical portion.

4,312,393

COUPON ORGANIZER

Richard L. Green, 7300 South Wabash, Chicago, Ill. 60611

Filed Feb. 21, 1980, Ser. No. 123,363
Int. Cl.³ A45C *11/18*
U.S. Cl. 150—39 6 Claims



1. A book-like coupon organizer for carrying and arranging coupons, said organizer including front and back panels, said front and back panels hingedly connected to each other for opening and closing said organizer, and a plurality of coupon-receiving pockets provided on the interior face of said panels, said pockets extending transversely to said hinge connecting said panels, and said pockets sized and shaped to receive unfolded coupons therein, said organizer comprising:

rigid front and back panel-forming members arranged in spaced edge-to-edge relation;

heat-sealable inner and outer plastic cover sheets for encasing said front and back panel-forming members therebetween and for forming said hinge connection between the front and back panel-forming members;

pocket-forming plastic sheet means positioned and heat-sealed upon the face of one of said plastic cover sheets, said pocket-forming sheet means repeatedly folded back on itself in a stepped fashion to form a plurality of coupon-receiving pockets;

said cover sheets and said pocket-forming sheet being sealed to each other (a) about the periphery thereof so as to encase said panel-forming members between said inner and outer cover sheets and (b) between the spaced edges of said panel-forming members so as to form said hinge between said front and back panels and to separately encase each of said panel-forming members, thereby forming the front and back panels with coupon-receiving pockets on the interior faces thereof, said pockets extending fron one side edge of the front and back panels to the other and transverse to said hinge.

4,312,394

POLYURETHANE PNEUMATIC TIRE WITH NEUTRAL AXIS OF SIDEWALLS HAVING INCREASING BENDING RADIUS

Joachim Thorns, Seevetal; Klaus Meier, Buxtehude, and Klaus Jordan, Mölln, all of Fed. Rep. of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 45,508, Jun. 4, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,633
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835398
Int. Cl.³ B60C *9/18, 3/00*
U.S. Cl. 152—353 R 9 Claims

1. A pneumatic tire of the type made of a moldable polyurethane elastomer which can be made into an elastic, plastic material by means of a chemical reaction and including a tire crown having a tread surface, a pair of tire beads and a pair of tire sidewalls, the latter of which each extend between and join together said crown and one of said beads, said tire also having

a circumferentially-extending belt embedded in said crown beneath said tread surface thereof, the improvement comprising:

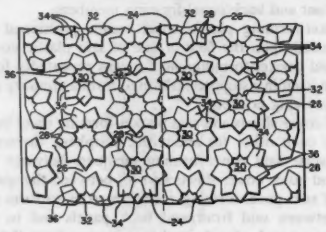
said tire sidewalls having a substantially uniform wall thickness from said tire beads to said crown, said tire sidewalls also having a neutral axis and a radius of curvature, the latter of which as measured relative to the neutral axis thereof, increases in length in a direction from said bead to an edge of said belt.

4,312,395

DOUBLE CONTOUR BLOCK TREAD PATTERN

Andre E. J. Baus, Bettembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 19, 1979, Ser. No. 105,433
Int. Cl.³ B60C *11/10, 11/12*
U.S. Cl. 152—209 R **12 Claims**



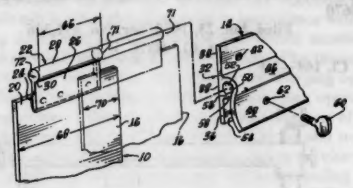
1. A pneumatic snow and ice tire comprising a circumferentially extending ground-engaging tread portion, a pair of sidewall portions extending radially inward from said ground-engaging tread portion terminating in a pair of bead portions, a cord reinforcing ply structure extending from bead portion to bead portion, said tire characterized by said tread portion consisting essentially of a plurality of independent projections each of said independent projections having a closed loop configuration which forms an internal recessed portion having an inner contour surface, said closed loop configuration being such that no groove extends from said internal surface radially outward to said outer surface of said projection, said projections being spaced apart so as to provide a plurality of grooves adjacent the outer periphery of said independent projections, the width of said grooves being sufficiently large so as to provide a plurality of water channeling passages when said tread portion is in the footprint of the tire, each of said projections having a plurality of substantially straight sipes which extend from said internal surface substantially radially outward to said outer surface dividing said projection into at least three substantially identical sub-elements, said sipes when in the footprint of the tire close at the tread surface, said sub-elements when in the footprint of the tire assist adjacent said sub-elements in resisting tangential forces.

4,312,396

STRIP CLOSURE WITH IMPROVED SUPPORT SYSTEM

Duane M. McKinnon, 12766 Cypress Ave., Chino, Calif. 91710, and David A. McKinnon, 1380 Fredricks La., Upland, Calif. 91786

Filed Oct. 22, 1979, Ser. No. 87,011
Int. Cl.³ A47H *23/05*
U.S. Cl. 160—332 **9 Claims**



1. A strip closure with an improved mounting system for enclosing an opening in a structure, the closure including:

a plurality of flexible strips having thickness, width, and length, and an upper end;

a plurality of attachment members, each attachment member being attached to at least a portion of said upper end of said flexible strip, having a bead thereacross of a thickness greater than the thickness of said flexible strip, and including a planar portion which extends downwardly from said bead and is attached to said upper end of said attached strip, said bead being cylindrical in shape and oriented horizontally with respect to said attached strip which hangs therefrom; and

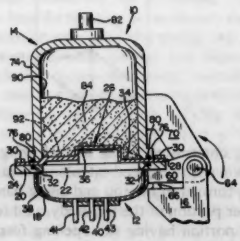
mounting member means having means for horizontal attachment to the structure, an inverted channel portion with at least one open end, said inverted channel portion being shaped to retain said beads of said attachment members when subjected to vertical force, and means to close said inverted channel portion at least at said one open end, said attachment member having a width which is less than the width of said attached strip, each of said beads having opposite ends and abutment surfaces on said opposite ends thereof whereby when adjacent attachment members are placed with their abutment surfaces in abutment, said attached strips overlap.

4,312,397

PROCESS FOR FORMING SHELL MOLDS

David L. Harris, Oregon City, and Colin Taylor, Lake Oswego, both of Oreg., assignors to Dependable-Fordath, Inc., Sherwood, Oreg.

Filed Apr. 14, 1980, Ser. No. 140,296
Int. Cl.³ B22C *9/12*
U.S. Cl. 164—7.1 **2 Claims**



1. A process for forming shell molds and shell cores using a sand tank, a pattern holder, a vented pattern mounted on the pattern holder and forming a first chamber therewith, and means for controllably introducing gas into and withdrawing

gas from the first chamber, the process comprising the sequential steps of:

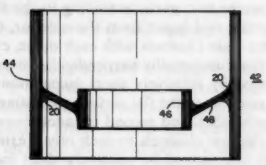
a. providing a mixture of granular material and a gas-curing binder in the sand tank;
b. sealably mounting the pattern holder atop the sand tank to form a second chamber defined between the vented pattern and the interior of the sand tank, the chambers communicating through vents in the vented pattern;
c. pulling a partial vacuum in the chambers by withdrawing gas from the first chamber;
d. then inverting the joined sand tank and pattern holder to allow the mixture to fall onto shell-forming surfaces of the vented pattern;
e. introducing a gas catalyst into the first chamber to cure a predetermined amount of the mixture adjacent to the vented pattern to form a shell of a predetermined thickness;
f. withdrawing the gas catalyst from the chambers by pulling a vacuum pressure greater than the partial vacuum initially pulled, thereby to prevent further curing;
g. then inverting the joined sand tank and pattern holder to allow the uncured mixture to fall away from the shell, the chambers still remaining under vacuum;
h. returning the chambers to atmospheric pressure;
i. separating the pattern holder from the sand tank; and
j. removing the shell from the shell-forming surfaces.

4,312,398

METHOD OF FORMING FIBER AND METAL COMPOSITE STRUCTURES

Joseph J. Van Blunk, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1979, Ser. No. 79,880
Int. Cl.³ B22D *19/14*
U.S. Cl. 164—108 **16 Claims**



1. The method of forming a composite structure from a fiber material and a second material which comprises:
coating the fiber material with an investment grade wax;
then bending the coated fiber material into a preform, said bending being performed to bend the fibers to a degree greater than that which would cause fracture of the fiber material if not coated with said investment grade wax;
then removing the investment grade wax binder; and
then infiltrating the voids created by removing the wax from the fiber material with the second material.

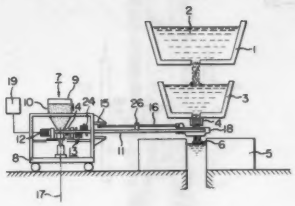
4,312,399

FLUX POWDER SUPPLYING APPARATUS FOR CONTINUOUS CASTING

Nishida Shinji, Okayama; Ohtsuka Takashi, Bizen; Satoh Mitsukuni, Okayama, and Kashimoto Satoru, Wake, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1979, Ser. No. 129,383
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—418 **1 Claim**

1. A flux powder supplying apparatus for continuous casting comprising a moving car arranged near a casting mould, a screw conveyor on said car mounted through the lower portion of a flux powder supplying hopper, a screw driving motor for said screw conveyor, a crank mechanism for providing a swinging motion to said screw conveyor, an arc-shaped guide mounted on said car, a guide rod, a bracket member supporting said guide rod on said screw conveyor, one end of said guide rod being fitted through a sliding member to said arc-shaped guide, and the other end of said guide rod being connected to



a nozzle opening idly fitted at the end of said screw conveyor whereby the nozzle opening is reciprocally and linearly movable with optional control over the width direction of the mould during said swinging motion of said screw conveyor.

4,312,400

CONTINUOUS CASTING METHOD AND MOLD FLUX POWDERS

George F. Carini, Penn Hills, Pa., assignor to The Clay Harden Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 874,024, Feb. 1, 1978, Pat. No. 4,190,444. This application Feb. 25, 1980, Ser. No. 124,342
The portion of the term of this patent subsequent to Feb. 26, 1997, has been disclaimed.
Int. Cl.³ C22B *9/10;* **B22D** *11/00, 27/00*
U.S. Cl. 164—472 **9 Claims**

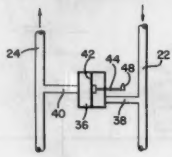
1. In the continuous casting of steel wherein the steel is teemed from a tundish to a continuous casting mold, the improvement comprising introducing to said mold during teeming, a mold flux powder, consisting essentially of, in weight percent, at least three sequentially melting systems,
the first system comprising 10 to 30 percent of one or more first glasses having softening point temperatures between 1200° and 2000° F.,
the second system comprising 10 to 30 percent fluorspar mixed with sodium fluoride, and
the third system comprising 40 to 80 percent of a mixture of a second glass having a softening temperature higher than said first glass or glasses and whiting, the weight ratio of said second glass to whiting in the mold flux powder being in the range 0.5 to 2,
whereby the fusion point, rate of fusion and fluidity can be tailored to the particular continuous casting process involved.

8. A composition of matter useful as a flux consisting essential of, by weight
40 to 80 percent of a mixture of refractory glass and whiting in a weight ratio between 0.5 and 2,
10 to 30 percent of a mixture of fluorspar and sodium fluoride,
10 to 30 percent by weight of one or more glasses having a lower softening temperature than said refractory glass, and analyzing, by weight percent
Na_2O-8 to 18; K_2O-up to 8; B_2O_3-15 to 25; SiO_2-20 to 35; F_2-4 to 8; CaO-10 to 15; and BaO-10 to 15,
said refractory glasses analyzing, by weight percent,
SiO_2 in excess of 60; alkali oxides less than 20; total F_2, B_2O_3, Fe_2O_3 less than 1; the remainder being alkaline earth oxides and Al_2O_3.

4,312,401
HEAT TRANSFER SYSTEM

William H. Zebuhr, Nashua, N.H., assignor to Sunhouse, Inc., Nashua, N.H.

Filed Sep. 7, 1979, Ser. No. 73,570
Int. Cl.[3] G05B *1/00*
U.S. Cl. 165—39 2 Claims

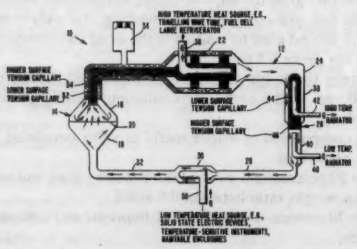


1. A heat transfer system comprising: a first conduit through which a first body of fluid may flow; a second conduit through which a second body of fluid may flow; an inlet at one end of the second conduit and an outlet at the other end of the second conduit; a pump so mounted to the second conduit as to be operable to force the second body of fluid from a source of the second body of fluid through the inlet; a mid-portion in the first conduit that is contiguous to the second conduit where heat transfer takes place between the two bodies of fluid pursuant to the flow of the bodies of fluid through the conduits; an entrance end in the first conduit through which the first body of fluid may flow towards said mid-portion; an exit end in the first conduit through which the first body of fluid may flow away from said mid-portion; an electric motor so connected to the pump as to operate the pump when the motor is actuated; a pressure switch interposed between said entrance end and said exit end and so constructed and arranged as to be closed in response to a pressure differential between said entrance end and said exit end, said pressure differential being responsive to the flow of the first body of fluid through the first conduit; and circuitry so connecting the switch to the motor as to actuate the motor pursuant to the closing of the switch.

4,312,402
OSMOTICALLY PUMPED ENVIRONMENTAL CONTROL DEVICE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 19, 1979, Ser. No. 77,259
Int. Cl.[3] F28D *15/00*
U.S. Cl. 165—104.22 21 Claims



1. An osmotically pumped environmental control system comprising a closed circuit heat pipe including an osmotic pump with solvent and solute-solvent mixture reservoirs separated from one another by a solvent permeable membrane and means for inserting heat into and for withdrawing heat from said closed circuit heat pipe, in which said heat inserting means is coupled to sources of waste heat for transferring heat produced thereby to said closed circuit and in which said heat withdrawing means comprises at least a pair of cooling stages in series respectively for condensing said solvent vapor into a condensate and for cooling said condensate.

4,312,403
HOT WATER RADIATOR

Thom Henningsson, Nyodlingsvägen 9, S-191 40 Sollentuna, Sweden

PCT No. PCT/SE78/00078, § 371 Date Jul. 17, 1979, § 102(e) Date Jul. 16, 1979, PCT Pub. No. WO79/00301, PCT Pub. Date May 31, 1979
PCT Filed Nov. 15, 1978, Ser. No. 120,567
Claims priority, application Sweden, Nov. 17, 1977, 7712994
Int. Cl.[3] F28F *3/12*
U.S. Cl. 165—170 4 Claims

1. A radiator comprising two main parts each having a flat surface provided with indentations, said parts being placed one over the other with the indentations extending outwardly from the interface of the parts, a first relatively long main channel formed by certain of the indentations in the two parts, extending in a first direction and for supplying liquid to the radiator, a second relatively long main channel formed by certain of the indentations in the two parts, extending in the first direction and for removing said liquid from the radiator, first channels connecting the main channels with each other, extending in a second direction substantially perpendicular to the first direction and formed by relatively short indentations in the two parts and by portions of the flat surface separating the indentations from each other, and second channels connecting more than two of the first channels to each other, extending in the first direction and formed by relatively short indentations in the two parts and by portions of the flat surface separating the indentations from each other, wherein each of said relatively short indentations of at least one of the main parts are of an elongated configuration and has an end located in the vicinity of the ends of at least two other short indentations and that said ends of the relatively short indentations in the vicinity of one another communicate with each other via an indentation in the other part.

4,312,404
ROTATING BLOWOUT PREVENTER

John T. Morrow, Spring, Tex., assignor to Lynn International Inc., Conroe, Tex.

Filed May 1, 1980, Ser. No. 145,716
Int. Cl.[3] E21B *33/06*
U.S. Cl. 166—84 7 Claims

1. A new and improved rotating blowout preventer adapted to be mounted on a blowout preventer stack located below a rotating drilling table in an oil well derrick floor, comprising:

a stationary housing adapted to be mounted on a blowout preventer stack, said stationary housing including a main bore adapted to receive a kelly or other piping;

said stationary housing further including a flowline housing portion adapted for connection to a recirculating flowline, said flowline housing having a bore directed transversely to the main stationary housing bore;

a bearing housing generally cylindrical in configuration and

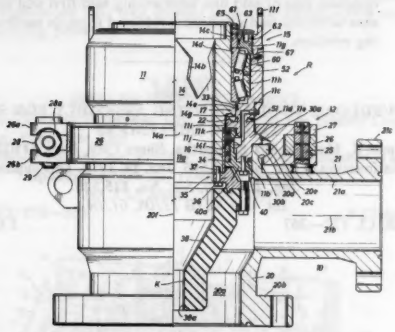
having a bearing housing bore axially aligned with said main stationary housing bore;

clamp means for removably connecting said bearing housing to said stationary housing;

a rotatable sleeve positioned within said bearing housing bore and bearing means positioned between said rotatable sleeve and said bearing housing and mounting said rotatable sleeve for rotation with respect to said bearing housing;

a stripper rubber and means attaching said stripper rubber to said rotatable sleeve for rotation therewith;

seal means mounted with said bearing housing in sealing engagement with said rotatable sleeve to prevent well fluid from flowing between said bearing housing and said rotating sleeve;



said rotating sleeve and said bearing housing cooperating to provide leak protection means to isolate said seal means from bearing means and divert well fluid leaking past said seal means outwardly of said bearing housing;

and

said bearing housing and said rotating housing cooperating to form a circumferential passageway located between said seal means and said bearing means, said bearing housing forming a lower portion and said rotating housing forming an upper portion of said circumferential passageway and a plurality of radial passageways located in said bearing housing in fluid communication with said circumferential passageway for directing outwardly of said bearing housing well fluid leaking past said seal means.

4,312,405

CEMENTING PROCEDURE FOR CASING

Lawrence B. Wilder, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

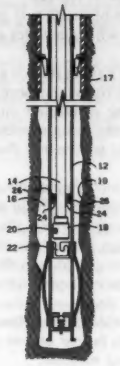
Filed Jul. 3, 1980, Ser. No. 165,523
Int. Cl.³ E21B *33/14, 33/16*
U.S. Cl. 166—285 **4 Claims**

1. A method for setting a casing in a wellbore comprising:

(a) suspending said casing in said wellbore,

(b) suspending a tubing string in said casing

(c) attaching the lower end of said tubing to the lower portion of said casing; and



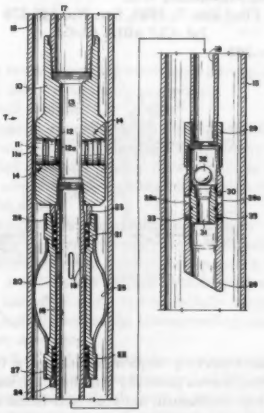
(d) oscillating and reciprocating said tubing while placing cement in at least a part of the annulus between the lower portion of said casing and the wall of said wellbore.

4,312,406

DEVICE AND METHOD FOR SHIFTING A PORT COLLAR SLEEVE

Charles H. McLaurin, Wichita Falls, and Wayne F. Nelson, Waxahachie, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1980, Ser. No. 122,947
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—386 **9 Claims**



1. In combination, a port collar, port collar sleeve, and tool for shifting the sleeve, the combination including:

a port collar which is coupled between sections of a well casing, and which has at least one fluid outlet port therein;

a port collar sleeve which has at least one fluid outlet port therein, which has a groove defined on the inside wall surface of said sleeve, and said sleeve being slideable within the port collar to an open position in which the fluid outlet port in said sleeve is in alignment with the fluid outlet port in said collar, and said sleeve being slideable to a closed position in which the fluid outlet port in said sleeve is not in alignment with the fluid outlet port in said collar;

a tubing string which has a top and bottom end, which is positioned in the well casing, and which is connected into a source of fluid at its top end;

a shifting tool assembly which is position inside the port collar sleeve, and which includes a housing member and a piston assembly;

the housing member having therein a lengthwise bore which is intersected by a transverse bore, the bottom end of the tubing string being connected into the lengthwise bore, and the tubing string being adapted to carry an operating fluid from the fluid source into the lengthwise bore of the housing member;

the piston assembly including an inside piston section and an outside piston section, the piston assembly being slideable inside the transverse bore of the housing member, the inside piston section having an operating face adapted to engage the operating fluid, and the outside piston section having a seating face adapted for seating into the groove in the port collar sleeve;

a hollow mandrel which has at least one fluid outlet port therein, and which fastens on one end into the lengthwise bore of the housing member;

a packing sleeve assembly which is positioned on the mandrel, which is slideable to a closed position in which the sleeve assembly covers the fluid outlet port in the mandrel, and which is slideable to an open position in which said fluid outlet port is uncovered;

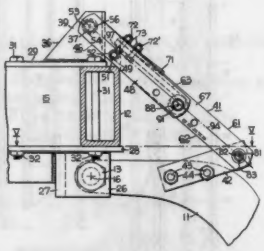
a check valve assembly which is positioned inside the mandrel, said valve assembly having a closed position which blocks fluid from flowing through the mandrel, and an open position which allows fluid to flow through the mandrel.

4,312,407

SPRING TRIP MECHANISM FOR PLOWS

William D. Crosby, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 7, 1980, Ser. No. 110,220
Int. Cl.³ A01B *61/04*
U.S. Cl. 172—261 **11 Claims**



1. In an earthworking implement having a frame, a tool standard, pivotal means pivotally attaching the standard to the frame and a trip mechanism between said frame and standard normally maintaining said standard in an earthworking position and accommodating pivotal movement about said pivot means when excessive working forces are imposed on said standard, characterized by said trip mechanism including

a first rigid link pivotally connected at one of its ends to said frame on a first horizontal axis

a second link having

a rigid part pivotally connected at one of its ends to said standard on a second horizontal axis in parallel, spaced relation to said first axis and

a leaf spring rigidly secured at one of its ends to the other end of said rigid part and having a flat part extending a predetermined distance toward said one end of said rigid part, where it terminates in a bearing portion presenting a bearing surface disposed below said flat part of said spring,

a pivot pin cooperatively engaging said bearing surface of said bearing portion and pivotally connecting the latter to the other end of said first link on a third axis parallel to and disposed intermediate said first and second axes,

cooperating abutments on said first and second links, respectively, normally engaging to limit relative pivotal movement in one direction, said abutments being located intermediate said first and third axes,

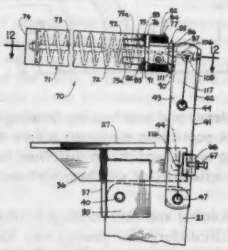
said third axis being in an overcenter position relative to a line intersecting said first and second axes when said abutments are in engagement, said leaf spring deflecting under tension loading when excessive working forces are imposed on said standard causing said third axis to move from said overcenter position to a tripped position on the opposite side of said line intersecting said first and second axes whereby said standard is released from its earthworking position.

4,312,408

OVERLOAD TOOL MOUNTING ASSEMBLY FOR SOIL TILLING IMPLEMENT

Elmer K. Hansen, 801 S. Martha, Sioux City, Iowa 51102

Continuation of Ser. No. 915,565, Jun. 14, 1978. This application Jan. 25, 1980, Ser. No. 115,520
Int. Cl.³ A01B *13/08, 61/04*
U.S. Cl. 172—267 **1 Claim**



1. A tool coupling assembly for mounting the shank of a ground tool to a clamping member carried on the lower side of a tool bar of a soil tilling farm implement for pivotal movement of the tool from a normal operating soil engagement position to an inoperative position upon encountering an obstruction during a tilling operation, said assembly comprising:

(a) a mounting member fixed to a lower portion of said clamping member,

(b) a first pivot means pivotally connecting said tool shank with said mounting member,

(c) a variable pressure means for applying a variable pressure on said tool during movement of the tool from an operating soil engaging position to a rearwardly moved inoperative soil engaging position,

(d) said variable pressure means including:

(1) a pair of link members, one of which is of a longer length than the other, arranged in an upright side by side relation when the tool is in an operating soil engaging position,

(2) means pivotally interconnecting the upper portions of said link members for relative pivotal movement about a common axis extended laterally thereof,

(3) a second pivot means pivotally connecting said tool shank with a lower portion of said one link member at a position forwardly of said first pivot means,

(4) a third pivot means pivotally connecting said mounting member with a lower portion of said other link member,

(5) a yieldable pressure unit interconnecting the upper end portions of said link members for applying a yieldable

pressure on each of said link members, said pressure unit including:

(a) a compressible spring bias member mounted on one of said link members and having a spring member,

(b) flexible means for connecting said other of said link members to said spring member whereby said spring member is compressed during said relative pivotal movement of said link members,

(e) said variable pressure means in a first moved position thereof acting to initially hold said tool in the operating soil engaging position therefor, and in a second moved position being rendered ineffective to move said tool from the inoperative soil engaging position to the operating soil engaging position therefor, said variable pressure means being movable from the first position to the second position therefor in response to said tool striking an obstruction in the soil providing for the application of a counter pressure on said tool greater than said initial acting tool holding pressure.

4,312,409

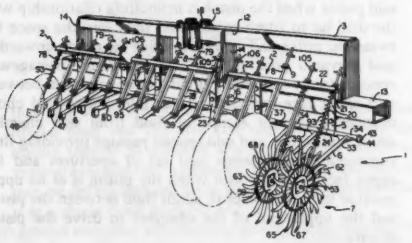
ROTARY HOE IMPLEMENT

Franky D. Mills, Plainview, Tex., assignor to The Hamby Company, Plainview, Tex.

Continuation of Ser. No. 929,003, Jul. 28, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 200,773

Int. Cl.³ A01B *21/04, 39/08*

U.S. Cl. 172—551 **9 Claims**



1. An agricultural rotary hoe implement unit comprising:

(a) at least two upstanding spacer members having first and second ends, said spacer members being separated transversely from each other relative to a line of draft;

(b) attachment means for connection of said spacer members to a tool bar for drafting by a prime mover;

(c) an elongate beam connected to first ends of said spacer members and extending transversely to a line of draft, said beam having a plurality of means defining spaced apertures through said beam and extending along the length thereof;

(d) an elongate pivot rod connected to said second ends of said spacer members and extending transversely to a line of draft;

(e) a plurality of tool support arms having forward ends swingably connected to said pivot rod for upward and downward swinging movement and having rearwardly disposed distal ends;

(f) a plurality of adjustment rods having rearward end portions swingably attached to the distal ends of said tool support arms and forward end portions reciprocably extending through respective said apertures and spaced in a generally vertical plane from the respective forward ends of said tool support arms whereby said adjustment rods extend in diverging forward relationship to respective said tool support arms;

(g) spring members respectively sleeved on said adjustment rods and extending at least part way between said forward and rearward end portions thereof and having one end portion for biasing engagement with said elongate beam to urge the rearward end portions of said adjustment rods toward an earth surface;

(h) adjustment stop means engaged with said adjustment rods and contacting said spring members to control biasing pressure of said spring members relative to said elongate beam;

(i) a plurality of rotary hoes and pivotal means connecting said rotary hoes to said distal ends of said hoe support arms for travel in respective upright planes over an earth surface;

(j) said elongate beam and said pivot rod being of a substantially equal length less than the length of said tool bar to comprise a fraction thereof whereby two or more rotary hoe implement units are attachable to said tool bar in selectively spaced relationship.

4,312,410

ROTARY EARTH CRUMBLING IMPLEMENT

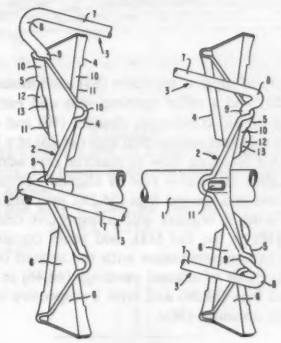
Helge H. Andersen; Mathias Andersen, both of Soro, and Finn Jensen, Vemmelev, all of Denmark, assignors to Kongskilde Koncernselskab A/S, Denmark

Filed Dec. 27, 1979, Ser. No. 112,445

Claims priority, application Denmark, Aug. 7, 1979, 3311/79

Int. Cl.³ A01B *27/00*

U.S. Cl. 172—552 **3 Claims**



1. A rotary earth crumbling implement having a plurality of annular units, each of said units comprising

a carrier shaft section;

a pair of spaced mounting discs fixed to the shaft section, each of said mounting discs having a plurality of substantially radial channels having slots formed in the bottoms thereof; said discs having deformable edge portions bordering the slots;

a plurality of separate substantially U-shaped resilient stirrups of rod material releasably secured to said discs, each of said stirrups having a body portion which lies substantially in a cylindrical surface around said shaft section between said discs and a pair of radially inwardly extending legs partially within the corresponding channels of the respective discs; and,

wherein each of said legs includes a convex section spaced radially outward from the inner end of the leg and which extends into and partly through a respective one of said slots in a respective one of said mounting discs, said slots being narrowed by deformation of the deformable edge portions after the insertion of the convex leg sections therein for locking said convex leg sections in place.

4,312,411

SLIDE RAIL ASSEMBLY FOR A WORK VEHICLE

Gary P. Freese, Joliet, and Robert J. Trayler, Braidwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

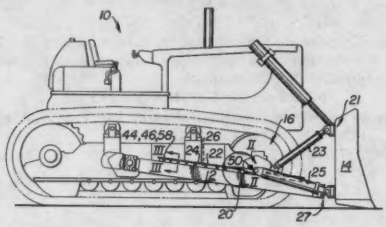
Continuation-in-part of Ser. No. 973,044, Dec. 12, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,599

Int. Cl.³ E02F *3/76*

U.S. Cl. 172—823 **6 Claims**

1. In a slide rail assembly (18) having a rail (22) and first and

second spaced apart legs (24,26), said legs (24,26) each having a plurality of openings (44,46) and each being connected to and positioned along said rail (22) and defining a continuous channel (40) with said rail (22) between said legs (24,26), said rail (22) having a plurality of openings (48) passing through said rail (22) and into communication with said channel (40), said openings (44) of said first leg (24) each being generally in alignment with a respective one of said openings (46) of said second leg (26) across said channel (40) and each being positioned adjacent a respective one of said openings (48) of said rail (22), the improvement comprising:



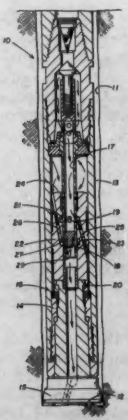
a plurality of support members (54) each having a pin opening (56) and a relief opening (58) and each being positioned in said continuous channel (40) and extending between said first and second legs (24,26) at a location sufficient for blocking flow of material into said channel (40) through a respective pair of aligned openings (44,46) in said first and second legs (24,26), said pin openings (56) each being in register with a respective one of the openings (48) of the rail (22), said relief openings (58) each being in communication with the related one of said respective pair of aligned openings (44,46) in said first and second legs (24,26) and with a respective related one of the pin openings (56).

4,312,412

FLUID OPERATED ROCK DRILL HAMMER

Dan L. Pillow, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 6, 1979, Ser. No. 64,287
Int. Cl.³ E21B 4/14
U.S. Cl. 173—17 **1 Claim**



1. A pressurized fluid operated rock drill hammer, comprising:

an annular body defining a cylindrical chamber having an upper end and a lower end;

a drill chuck mounted at the lower end of said body;

a drill bit connected to said drill chuck and extending into said chamber;

a tubular fluid feed tube mounted in said body and extending into said chamber from said upper end toward the drill chuck and defining a high pressure section above a choke member in the lower end of said tube;

a set of apertures in said feed tube located at a single axial position for transmitting all of said pressurized fluid to said chamber;

a piston slidably mounted in said chamber and having an axial bore for slidingly engaging said feed tube and moveable between a position impacting the drill bit at the lower end of the chamber and an elevated position at the upper end of said chamber, said piston having an upper surface and a lower surface;

a first passageway in said piston for fluid communication from the lower surface of the piston to a first channel open to said axial bore;

a second passageway in said piston for fluid communication from the upper surface of the piston to a second channel open to said axial bore;

an exhaust passage for discharging pressurized fluid from said chamber through said bit, said exhaust passage having an inlet below said choke member;

said first passage providing fluid communication between said set of apertures in the feed tube and the lower face of said piston when the piston is in abutting relationship with the drill bit to admit pressurized fluid into the space between the piston and drill bit to drive the piston upward to said elevated position and said secondary passageway concomitantly providing fluid communication between said upper face and said exhaust inlet below said choke member to permit escape of fluid from said chamber above said piston, and said second passage providing fluid communication between said set of apertures and the upper face of said piston when the piston is at its upper position in the chamber to admit fluid between the piston and the upper end of the chamber to drive the piston downward.

4,312,413

DRILLING APPARATUS

James B. Loftis, P.O. Box 38, Remlap, Ala. 35217

Continuation of Ser. No. 958,985, Nov. 9, 1978, abandoned. This application Nov. 18, 1980, Ser. No. 207,994
Int. Cl.³ E21B 7/02
U.S. Cl. 173—23 **4 Claims**

1. The combination with drilling apparatus having a relatively long elongated vertical frame supporting a transmission unit for longitudinal movement therein with the transmission unit operatively connecting a longitudinally extending polygonal vertical drive shaft to a driven head disposed to be threadedly connected to one end of an adjacent drill rod section extending in axial alignment therewith with the other end of the drill rod section being threadedly connected selectively to another drill rod section and a drill bit for drilling a hole into the earth, the improvement in means for driving said polygonal vertical shaft and supporting said elongated frame, comprising:

(a) an upper drive unit carried by the upper end of said elongated frame and having a centrally disposed vertical drive shaft at the center of mass of said drive unit and in axial alignment with one end of said polygonal vertical shaft,

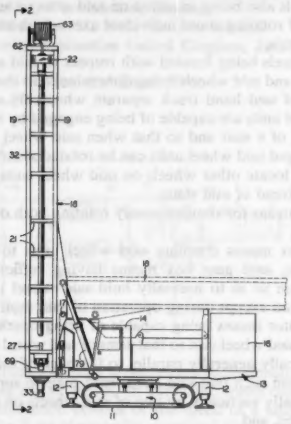
(b) a lower drive unit carried by the lower end of said elongated frame and having a centrally disposed vertical drive shaft at the center of mass of said drive unit and in axial alignment with the other end of said polygonal vertical shaft,

(c) bearing support means connecting said upper drive unit in driving relation with said upper end of said polygonal

vertical shaft for rotating said polygonal shaft in one direction,

(d) means connecting said lower drive unit in driving relation with said lower end of said polygonal vertical shaft for rotating said polygonal shaft in said one direction so that torque is exerted concomitantly at opposite ends of said polygonal shaft to drive said polygonal shaft in said one direction,

(e) a translatable frame supporting said elongated vertical frame for complete orbital rotation about a vertical axis so



that said elongated frame is rotatable to position said driven head and the drill rod section threadedly connected thereto at selected angular positions about said vertical axis whereby a plurality of angularly spaced holes may be drilled into the earth while said translatable frame is at a single fixed position, and

(f) ground engaging adjustable jacks carried by said translatable frame for supporting said translatable frame at said single location while said elongated frame is rotated to said selected angular position.

4,312,414

METHOD AND APPARATUS FOR OBTAINING SATURATION DATA FROM SUBTERRANEAN FORMATIONS

Arthur Park, Odessa, Tex., assignor to Diamond Oil Well Drilling Company, Midland, Tex.

Filed May 23, 1980, Ser. No. 152,849
Int. Cl.³ E21B *25/06, 25/10*
U.S. Cl. 175—59 **36 Claims**

1. Apparatus for recovery of subterranean fluid comprising:

means for boring a well core containing the subterranean fluid;

container means associated with said boring means for containing said well core; and

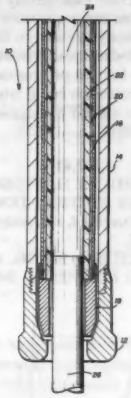
an oil and water absorbent member having a predetermined configuration disposed in said container means and proximately positioned adjacent said well core, said absorbent member having sufficient permeability and porosity for absorbing the subterranean fluid as the subterranean fluid emanates from said well core and for storing the absorbed subterranean fluid for later retrieval.

34. A method of obtaining subterranean fluid from an oil well comprising the steps of:

boring a well core in the oil well;

positioning a sponge-like absorbent member proximate said well core during boring;

removing said well core and said sponge-like absorbent member from the oil well; and



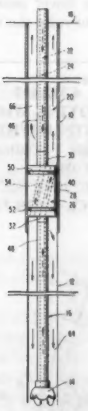
absorbing the fluid from said well core with said sponge-like absorbent member.

4,312,415

REVERSE CIRCULATING TOOL

Robert L. Franks, Jr., Lake Charles, La., assignor to Well Tools, Inc., Lake Charles, La.

Filed May 1, 1980, Ser. No. 145,432
Int. Cl.³ E21B *17/18*
U.S. Cl. 175—215 **12 Claims**



1. A device for reversing the flow of circulating fluid which comprises a cylindrical body, which has a flat upper surface and a flat lower surface, the flat upper surface and the flat lower surface being perpendicular to the central axis of the cylindrical body, a protrusion on the bottom of the cylindrical body, the central axis of the bottom protrusion generally lying on the central axis of the cylindrical body and the end of the bottom protrusion being externally threaded, the width of the bottom protrusion being less than the diameter of the cylindrical body, a protrusion on the top of the cylindrical body, the central axis of the top protrusion generally lying on the central axis of the cylindrical body, the width of the top protrusion being less than the diameter of the cylindrical body, a first passageway which lies generally on the central axis of the bottom protrusion and which extends through the cylindrical

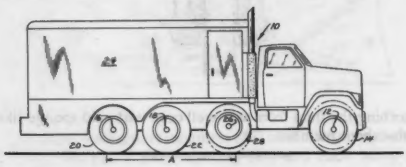
body to a site on the upper end surface of the cylindrical body located away from the interface of the cylindrical body and the top protrusion, and a second passageway which lies generally on the central axis of the top protrusion and which extends through the cylindrical body to a site on the lower end surface of the cylindrical body located away from the interface of the cylindrical body and the bottom protrusion, the end of the first passageway in the top protrusion being internally threaded, the first passageway and the second passageway not intersecting.

4,312,416

SCALE TESTING VEHICLE HAVING AN AUXILIARY AXLE FOR SECTION TESTING

William H. Hoyerman, Deerfield, Ill., assignor to General Body Company, Chicago, Ill.

Filed Jul. 21, 1980, Ser. No. 170,545
Int. Cl.³ G01G *19/52, 23/01;* B62D *61/12*
U.S. Cl. 177—50 **7 Claims**



1. In a vehicle for testing a vehicle weighing scale, said vehicle having a front axle and a rear driven axle for conventional transport, the improvement comprising an auxiliary vertically adjustable axle mounted between said front and rear axles, said auxiliary axle at its upper position raising its appended tires off the ground for conventional transport, and said adjustable axle at its lower position causing its tires to engage the ground so as to raise the tires of the front axle off the ground.

4,312,417

HAND TRUCK EMPLOYING WHEEL UNITS HAVING MULTIPLE WHEELS

Todd E. Dalton, and Ronald V. Dalton, both of 3801 Chestnut Ave., Long Beach, Calif. 90807

Filed Nov. 20, 1979, Ser. No. 96,250
Int. Cl.³ B62B *5/02*
U.S. Cl. 180—8 A **1 Claim**

1. In a hand truck having an elongated, vertically extending body, said body having upper and lower ends, a front and a back, toe plate means attached to said body at the front thereof adjacent to the lower end thereof for supporting a load, wheel means for supporting said body connected to said body adjacent to the lower end thereof and adjacent to the back thereof, and handle means connected to said body adjacent to the upper end thereof for use in manipulating said hand truck in which the improvement comprises:

said wheel means consisting of two separate, identical wheel units, one of said wheel units being located adjacent to one side of said body and the other of said wheel units being located adjacent to the other side of said body,

each of said wheel units consisting of a centrally located hub section, four arms spaced from one another so as to extend outwardly from said hub section, and a wheel rotatably mounted on each of said arms, said wheels being free to rotate on said arms at all times,

means connecting said hub sections of said wheel units so that said wheel units are both capable of rotating about an axis, said wheels being spaced equidistant from one another around said axis and equidistant from said axis, said wheels also being mounted on said arms so as to be capable of rotating about individual axes which are parallel to said axis,

said wheels being located with respect to said axis and said arms and said wheels being dimensioned so that during the use of said hand truck separate wheels on each of said wheel units are capable of being engaged by the riser and tread of a stair and so that when said wheel units are so engaged said wheel units can be rotated about said axis so as to locate other wheels on said wheel units on an adjacent tread of said stairs,

motor means for simultaneously rotating both of said wheel units,

gear box means coupling said wheel units to said motor means, said gear box means having sufficient internal friction so as to normally hold said wheel units against rotation except during operation of said motor means,

said motor means being capable of being operated so as to turn said wheel unit so that arms of said wheel units extend vertically generally parallel to the back of said body to a position such that said hand truck may be supported substantially vertically by two of said wheels on a horizontal surface, and

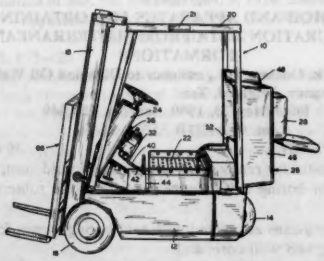
said motor means being capable of being operated so as to turn said wheel unit to a position such that said truck may be supported by four of said wheels on a horizontal surface with said body in other than a vertical position.

4,312,418

PIVOTED VALVE AND HOOD FOR LIFT TRUCK

Udo Rittman, Muelheim, Fed. Rep. of Germany, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 31, 1980, Ser. No. 136,013
Int. Cl.³ B62D *25/10*
U.S. Cl. 180—68.5 **10 Claims**



1. In a lift truck having an operator's station and a pivoted hood which normally covers a vehicle drive component of the truck such as a battery means and on which is mounted an operator's seat, said hood being pivotable rearwardly of the truck to a position in which said drive component is exposed, operator control means for operating one or more lift truck components supported from a position adjacent the front side of said drive component and having at least a portion thereof which normally overlies in a horizontal direction a portion of said drive component, and an opening in said hood registrable with said control means which extends upwardly through said

opening for operation by the operator when said control means is in said latter position and the hood is pivoted to its normally down position, said control means being pivotable forwardly on the support thereof to a position outside the projected area of said drive component in a vertical direction when said hood is pivoted rearwardly out of registry with said control means.

4,312,419

ELECTRICAL OVERRIDE ARRANGEMENTS, FOR EXAMPLE FOR VEHICLE SPEED CONTROL SYSTEMS

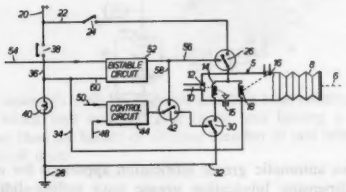
John Noddings, Coventry, England, assignor to Associated Engineering Limited, Warwickshire, England

Filed Jan. 23, 1980, Ser. No. 114,685

Claims priority, application United Kingdom, Jan. 23, 1979, 02367/79

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—177 **8 Claims**



1. An electrical over-ride arrangement in combination with, and for putting out of action, an automatic speed control system for the automatic control of the speed of a land vehicle having a brake light electrically energized on operation of a driver's brake control,

the automatic control system comprising an actuator for adjusting the vehicle's speed, actuator control means for controlling the actuator, an electronic circuit for controlling the actuator control means, an electrically energizable element, means connecting the element to the vehicle's source of electrical energization when the automatic speed control system is in action, means connecting the element to actuate the control means to put the automatic speed control system out of action when the element is de-energized, and disengaging means comprising an electrical disabling switch connected to one side of the said energizable element and in circuit therewith to de-energize the element in response to operation of the driver's brake control and thereby normally to put the said system out of action on operation of the driver's brake control,

the over-ride arrangement comprising connection means responsive to said operation of the driver's brake control to apply to the other side of the element an electrical potential substantially the same as the said source of energization applies to the said one side via the disabling switch whereby effectively to de-energize the said element in response to the said operation in the event of the disabling switch failing to do so, thereby to put the automatic speed control system out of action on failure of the said disabling switch to do so.

4,312,420

SOUND DIFFUSION PLANT WITH VERY LOW DIRECTIVITY

Luigi Gatti, Bologna, Italy, assignor to Harp S.a.S. di Luigi Gatti & C., Modena, Italy

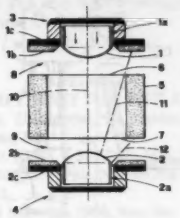
Filed Feb. 13, 1980, Ser. No. 121,301

Claims priority, application Italy, Feb. 16, 1979, 40023 A/79

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—146 **5 Claims**

1. A sound diffusion system having very low directivity, in particular of the multiway type, essential features of which are that each way comprises: a pair of vibrating diaphragms placed coaxially opposite and facing each other with a space therebetween, each of said diaphragms being placed under vibration by a corresponding electromagnetic circuit with both of said electromagnetic circuits being energized by the same electric signal; and a plurality of screening elements made of high acoustic absorption material, shaped and arranged in such a



way as to delimit in cooperation with said diaphragms, an internal space between said diaphragms that includes openings which communicate with the outside space and in which the high acoustic absorption material is positioned so that it intercepts all sound waves that issue radially from each diaphragm which do not intercept the other diaphragm.

4,312,421

SOUND ABSORPTION FOR A LAWNMOWER

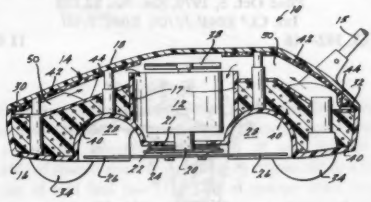
Peter P. Pioch, Idstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 7, 1980, Ser. No. 119,558

Claims priority, application European Pat. Off., Jan. 29, 1980, 80100453

Int. Cl.³ H02K *5/24*; A01D *67/00*

U.S. Cl. 181—202 **8 Claims**



1. In a power lawnmower comprising a motor and a housing substantially enclosing the motor, the improvement comprising:

a body of rigid sound absorbing material configured to substantially completely occupy the interior volume of said housing between the motor and the walls of said housing so as to reduce the noise level of said lawnmower while providing additional structural support for said housing.

4,312,422

EXHAUST SILENCER FOR OUTBOARD ENGINE WITH A REFLECTION CHAMBER

Yukio Matsushita, Iwata, and Takehisa Suzuki, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed May 30, 1980, Ser. No. 154,772

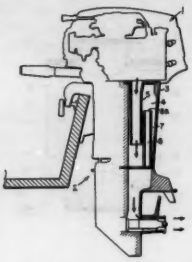
Claims priority, application Japan, Jun. 8, 1979, 54-72004

Int. Cl.³ F01N *1/08, 1/02*

U.S. Cl. 181—272 **11 Claims**

1. In an exhaust device for an outboard engine which includes an expansion chamber having communication with the

exhaust port of an engine unit for discharging engine exhaust gases therethrough, the improvement comprising a reflection chamber of predetermined length with one end opened into said expansion chamber and its other end closed, an exhaust



pipe projecting into said expansion chamber and discharging through an opening end of said exhaust pipe, said open end of said reflection chamber being reversely spaced from said open end of said exhaust pipe, and reversely faced relative thereto.

4,312,423

PACKAGING AND ENERGY SAVING DEVICES AND METHODS

Earl G. Helbig, 18 Gray's Farm Rd., Weston, Conn. 06883

Filed Oct. 5, 1979, Ser. No. 82,158
Int. Cl.³ E04F *11/06;* E06C *9/00*
U.S. Cl. 182—46 **11 Claims**

1. For use in connection with a unitized building component having a peripheral support frame,

a structural member made from material which is structurally rigid and of low thermal transmissivity,

said structural member being bottomless, having a top, and having side walls, the outside surfaces in the region of the exposed bottom edges of which are configured substantially as are the outside surfaces of the peripheral support frame of the component with which said member is to be associated, in the region of the top surfaces of said support frame,

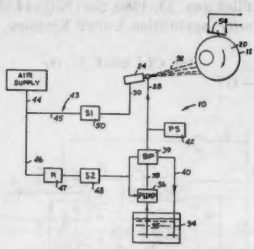
whereby said structural member may be positioned with the exposed bottom edges of its side walls juxtaposed to the top surfaces of said peripheral support frame, for use as a packaging device for said component and for use as a removable insulation device for use with said component after installation.

4,312,424

AUTOMATIC GREASE LUBRICATION SYSTEM FOR METERING AND DISPENSING LUBRICATION GREASE ONTO ROLLING-SLIDING, LINE CONTACT, BEARING SURFACE SURFACE

Harry M. Taylor; Terry L. Braaten, both of Centralia; Jack E. Stephens, Olympia, and Donald C. Geraci, Centralia, all of Wash., assignors to Washington Irrigation & Development Company, Spokane, Wash.

Filed Jul. 18, 1979, Ser. No. 58,506
Int. Cl.³ F01M *1/18, 11/10*
U.S. Cl. 184—6.4 **10 Claims**



1. An automatic grease lubrication apparatus for metering and dispensing lubrication grease onto rolling-sliding, line contact, bearing surfaces that are rotated about an axis, comprising:

a selectively operated airless spray nozzle directed at the bearing surface;

a source of bearing grease;

a high pressure pump means operatively interconnecting the source to the spray nozzle for pumping the grease from the source to the spray nozzle at a pressure greater than a desired minimum value; and

operating means responsive to the rotation of the surface about the axis and the grease pressure being greater than the desired minimum value for selectively operating the spray nozzle for a selected duration at a selected angular position of the bearing surface to spray grease onto the selected portion of the bearing surface during each revolution of the surface about the axis.

4,312,425

CYCLIC LUBRICANT DISTRIBUTOR VALVE

John P. Snow, Sagamore Hills, and James J. Callahan, Mentor, both of Ohio, assignors to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Sep. 11, 1978, Ser. No. 941,557
Int. Cl.³ F16N *25/02*
U.S. Cl. 184—7 D **2 Claims**

1. A cyclic lubricant distributor valve comprising

an inlet block unit having a lubricant inlet,

an end block unit,

a plurality of intermediate block units between said inlet and end block units,

each of said intermediate block units comprising a base member and a spool member,

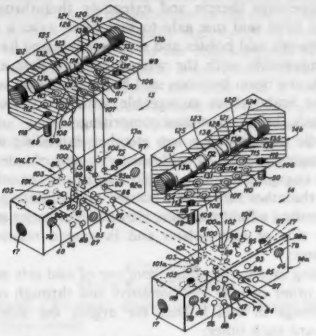
said spool member having a bore and a spool movable in said bore, and said base member having at least one outlet,

said spool member and said base member having cooperating faying faces abutting one another,

means forming hydraulic circuitry in said inlet block unit, said end block unit and said intermediate block units for interconnecting said inlet, said spools and said outlets to provide for cyclic operation of said valve,

said hydraulic circuitry interconnecting said spool members with their corresponding base members only through said cooperating faying faces,

first fastening means for fastening said inlet block units, said end block unit and said base members in fixed assembly, and second fastening means for fastening each spool member in



fixed assembly only to its corresponding base member, said inlet block unit and said end block unit having a height greater than the height of the base member of said intermediate block units.

4,312,426

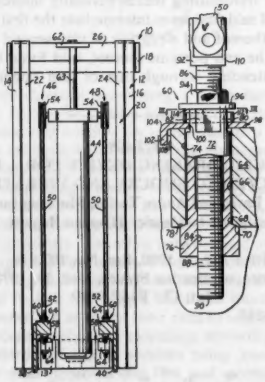
CHAIN ANCHORING ARRANGEMENT

Milford D. McVeen, Highland Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Mar. 10, 1977, Ser. No. 776,458

Int. Cl.³ B66B *9/20*; F16G *11/12*

U.S. Cl. 187—9 E **23 Claims**



1. In an anchoring arrangement for adjustably anchoring an end of a tension member adjacent a relatively stationary support, which comprises a relatively stationary support member having a bore therethrough; a seat portion of said support member formed adjacent an end of said bore; an adjustable sleeve within said bore, a first end of said sleeve having a seat engaging portion for bearing engagement with said seat portion of said support member, a second end of said sleeve extending outwardly from said bore, said sleeve defining a longitudinally extending threaded internal bore; and a connector having a threaded shank, a first end of said connector being in threaded engagement with said internal bore of said sleeve and a second end of said connector being attached to a tension member; an improvement comprising:

a non-circular surface formed on said second end of said sleeve;

a lock clip fitting about said second end of said sleeve, said lock clip having a generally central opening shaped to matingly fit over said non-circular surface and to be longitudinally slidable relative to said sleeve, said lock clip including a lock tab extending from a portion of the periphery thereof generally parallel to said bore; and

tab retention means defined by said support member for preventing said lock clip from rotating and thereby preventing said sleeve from rotating.

4,312,427

EXTRA LIFT MAST FOR LIFT TRUCKS

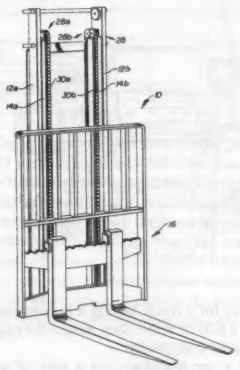
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00248, § 371 Date Mar. 10, 1980, § 102(e) Date Mar. 10, 1980, PCT Pub. No. WO81/02566, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 10, 1980, Ser. No. 195,718

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **6 Claims**



1. In an extensible mast assembly (**10**) having first (**12*a*, 12*b***) and second (**14*a*,14*b***) pairs of parallel spaced apart uprights, and a carriage assembly (**16**), each of said second pairs (**14*a*,14*b***) of spaced apart uprights being connected to a respective one of said first pair (**12*a*,12*b***) of spaced apart uprights, said second pair (**14*a*,14*b***) of spaced apart uprights being linearly movable relative to said first pair (**12*a*,12*b***) said carriage assembly (**16**) being connected to and substantially linearly movable relative to said second pair (**14*a*,14*b***) of spaced apart uprights, a pair of jacks (**24*a*,24*b***), each being positioned adjacent and substantially parallel to respective ones of said first (**12*a*,12*b***) and second (**14*a*,14*b***) pairs of spaced apart uprights, each of said second uprights (**14*a*,14*b***) having an upper end portion (**38*a*,38*b***) and each of said first uprights (**12,12*b***) having an upper end (**21*a*,21*b***) and a lower end portion (**58*a*,58*b***), each of said jacks (**24*a*,24*b***) being connected to the upper end portion (**38*a* and 38*b***) of a respective one of said second spaced apart uprights (**14*a*,14*b***) and to the lower end portion (**58*a*,58*b***) of a respective one of said first pair (**12*a*,12*b***) of spaced apart uprights, said jacks (**24*a*,24*b***) being extensible for moving said second pair (**14*a*,14*b***) of uprights relative to said first pair (**14*a*,14*b***), and a pair of flexible tension members (**30*a*,30*b***), each being connected to a respective one of said first uprights (**12*a*,12*b***) and said carriage assembly (**16**), the improvement comprising:

a pair of guide members (**28*a*,28*b***), each being affixed to the upper end portion (**38*a* and 38*b***) of a respective one of said second uprights (**14*a*,14*b***), each of said guide members (**28*a*,28*b***) being in engagement with a respective one of said flexible tension members (**30*a*,30*b***) and being movable

with and in response to movement of said second pair (**14***a*,**14***b*) of uprights;

said second pair (**14***a*,**14***b*) of spaced apart uprights being of a length shorter than said first pair (**12***a*,**12***b*) of spaced apart uprights;

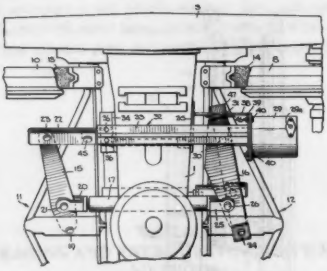
said carriage assembly (**16**) being movable to a preselected elevated position in response to the upper end portion (**38***a*,**38***b*) of said second pair (**4***a*,**14***b*) of spaced apart uprights being moved to an elevated location less than or equal to the upper end (**21***a*,**21***b*) of said first pair (**12***a*,**12***b*) of spaced apart uprights.

4,312,428

TRUCK MOUNTED BRAKE APPARATUS

Robert G. Beacon, Sparta, N.J., assignor to Ellcon-National, Inc., Totowa, N.J.

Filed Feb. 8, 1980, Ser. No. 120,008
Int. Cl.³ B61H *13/26*
U.S. Cl. 188—52 **8 Claims**



1. Brake apparatus for a truck having a bolster supported by wheels and having a pair of brake shoe means for engaging said wheels, said apparatus comprising:

a saddle having a top member and a pair of spaced side members for engaging said bolster, and having mounting means for mounting a fluid actuable, piston and cylinder assembly at one side of one of said side members in spaced relation to said one side member;

clamping means for securing said saddle to said bolster;

a fluid actuable piston and cylinder assembly mounted on said mounting means, the piston having a rod extending from said cylinder toward said one side member;

a first lever;

means for pivotally connecting a first portion of said first lever to said piston rod;

means for connecting a second portion of said lever spaced from said first portion thereof to one of said brake shoe means;

a second lever;

fulcrum means for pivotally connecting said second lever at one end to said saddle at the side thereof opposite to the side thereof at which said piston and cylinder assembly is mounted;

means for connecting the opposite end of said second lever to the other of said brake shoe means;

and brake force transmitting means for interconnecting a portion of said first lever intermediate the first and second portions thereof to an intermediate portion of said second lever, whereby movement of said piston rod in the brake applying direction causes movement of said first lever, said second lever and said brake shoe means in directions which will cause portions of said brake shoe means to engage said wheels.

5. In combination with a truck having a first axle with a pair of wheels at opposite ends thereof and spaced from and parallel to said first axle, a pair of frames supported by said axles, one frame extending between one end of one axle and one end of the other axle and the other frame extending between the other end of said one axle and the other end of the other axle, a bolster extending in its length direction from one frame to the other frame and disposed intermediate said axles, said bolster having openings therein and extending therethrough in the direction from said one axle to said other axle, a first brake beam between said bolster and said first axle and having brake shoes engageable with the wheels on said first axle, and a second brake beam between said bolster and said second axle and have brake shoes engageable with the wheels on said second axle, brake apparatus comprising:

a saddle comprising a top member extending across and engaging the top of said bolster, a pair of side members, one engaging one side of said bolster and the other engaging the other side of said bolster, and mounting means for mounting a fluid actuable, piston and cylinder assembly at one side of said bolster and in spaced relation to said bolster;

clamping means extending from one of said side members to the other of said side members and through one of said openings in said bolster for urging the side members toward each other;

a fluid actuable, piston and cylinder assembly mounted on said mounting means, said piston having a rod extending from said cylinder and toward said bolster;

a first lever having a first portion pivotally connected to said rod, a second portion spaced from said first portion and pivotally connected to the brake beam at the same side of said bolster as said piston and cylinder assembly;

a second lever having an end portion pivotally connected to said saddle at the side of said bolster opposite to the side of said bolster at which said first lever is disposed and pivotally connected at the opposite end portion thereof to the brake beam at the same side of said bolster as said second lever; and

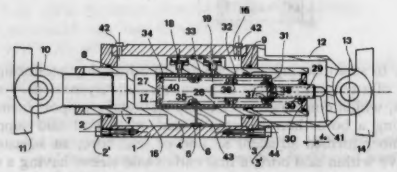
brake force transmitting means pivotally interconnecting a portion of said first lever intermediate the first and second portions thereof and a portion of said second lever intermediate the end portions thereof, said force transmitting means extending through one of said openings in said bolster.

4,312,429

HYDRAULIC BRAKING DEVICE FOR A LOAD SUBJECTED TO SHOCKS AND VIBRATIONS

Jean Masclet, Paris, and Andre Turiot, Morsang sur Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Apr. 2, 1980, Ser. No. 107,876
Claims priority, application France, Dec. 29, 1978, 78 36808
Int. Cl.³ F16F *9/49*
U.S. Cl. 188—315 **6 Claims**



1. Hydraulic braking apparatus for a load subject to shocks and vibrations, which is is installed between the load and a support, and is integrated with one of the elements constituted by the load and the support by a cylinder traversed in leakproof fashion by a main slide rod, which is integrated with the other of the elements, the load or the support, and whose part inside the cylinder has a super-thickness shaped as a main piston, sliding in leakproof fashion in the cylinder and defining with the latter two chambers filled with a hydraulic fluid that

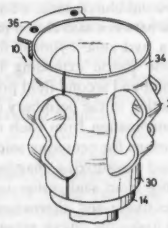
passes from one to the other of the two chambers through two flap valves which do not brake the circulation of the fluid at low speed, and one or the other of which, depending on the direction of displacement of the main rod in the cylinder insures the braking of the circulation of the fluid by throttling the latter to limit the rate of displacement of the rod in the cylinder under the influence of abnormally high forces on the load, and oppose a blocking reaction to the displacements developing under the influence of substantial accelerations as the result of shocks or vibrations, wherein the main rod is hollow and contains a reservoir of hydraulic fluid that communicates with each of the chambers in the cylinder through one of the flap valves, which are disposed in the superthickness of the main rod, a secondary piston mounted to slide in the main rod and urged by elastic means pressing against the main rod for insuring the pressurization of the reservoir which at the same time constitutes an accumulator of expansions of the hydraulic fluid.

4,312,430

SHOCK ABSORBER

Kuniji Ohtani, Chigasaki, Japan, assignor to Izumi Motor Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,831
Int. Cl.³ F16F *7/12*; B62D *1/10*
U.S. Cl. 188—377 **5 Claims**



1. A shock absorber comprising: a lower holding ring integral with a boss to be fixedly mounted on a steering post; an upper holding ring adapted for connection to a steering wheel hub; and a multiplicity of supporting elements connected to and extending axially between said upper and lower holding rings, said supporting elements being equally spaced about the circumference of said upper and lower rings, said elements each including a first portion connected to said upper ring and extending outwardly from a line between said upper and lower holding rings at a first angle, a second portion connected to said lower ring and extending outwardly from said line at an angle equal to said first angle, third and fourth intermediate portions connected at one of their ends to said first and second portions, respectively, and extending inwardly towards said line, said third and fourth portions being joined together at their other ends opposite said first and second portions, the joined ends of said third and fourth portions lying radially outwardly of said line, said third and fourth portions extending at a second angle to said line, said second angle being less than said first angle whereby said first and second portions bend radially outwardly on axial loading before said third and fourth portions bend radially inwardly.

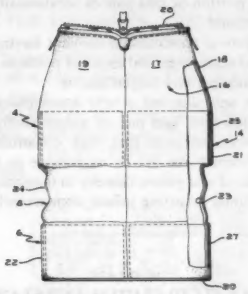
4,312,431

EXPANDABLE CARRYING CASE

Donald W. Corey, Wilbraham, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Continuation-in-part of Ser. No. 25,678, Mar. 30, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,476
Int. Cl.³ A45C *7/00*
U.S. Cl. 190—45 **2 Claims**

1. Expansible toilet case comprising top and bottom sections, each defined in part by upright walls, the external dimensions of one of said top and bottom sections being less than those of the other, an intermediate section interconnecting the lower end of said top section and the upper end of said bottom section, said intermediate section being composed of sufficiently pliable upright walls for enabling telescopic movement of said sections one within the other whereby the upright walls of said three sections are generally coextensive in height and the capacity of said case is related to the height of the top section, said bottom and intermediate sections being retractable from the top section for disposing said upright walls in end-to-end



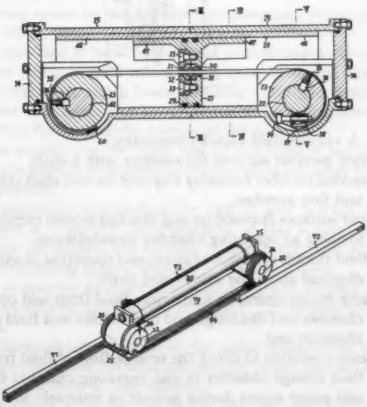
relation thus expanding said case to the cumulative height of the upright walls of said three sections, the upright walls of the top and bottom sections being relatively rigid in comparison to the intermediate section for facilitating the telescopic expansion and contraction of said three sections, said bottom section being smaller in cross section than the top section and being dimensioned relative thereto to enable telescopic movement of the bottom and intermediate sections within the top section in snugly fitted relationship, whereby the sections of the case are frictionally retained in telescoped condition without fasteners.

4,312,432

MULTIPLE FUNCTION ACTUATOR

Hiroshi Sugawa, 2-11, 2-chome, Minami-Nagasaki, Toshima-ku, Tokyo, Japan

Filed Jun. 25, 1979, Ser. No. 51,351
Claims priority, application Japan, Jun. 27, 1978, 53-77834
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 R **11 Claims**



1. An actuator comprising in combination:

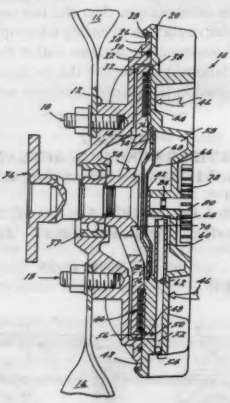
a piston-cylinder unit;
a pair of substantially parallel output shafts having axes substantially perpendicular to the central axis of the cylinder of said piston-cylinder unit and respectively including confined portions sealingly enclosed in the fluid-tight chamber defined by said cylinder and exposed portions projecting via seal means out of said fluid-tight chamber;
a substantially non-extensible and substantially flexible shut-in power transmission element fixedly connected to the piston of said piston-cylinder unit at the substantial center thereof and having ends fixedly connected relative to said confined portion of said pair of substantially parallel output shafts; and
a shut-out power transmission element having ends fixedly connected relative to said exposed portions of said pair of substantially parallel output shafts;
said shut-in and shut-out power transmission elements in combination with said pair of output shafts being operatively associated such that they constitute a complete pulley system to be driven responsive to the reciprocal movement of said piston thereby to transmit linear motion and rotational actuating power concurrently.

4,312,433

VISCOUS FLUID CLUTCH AND STANDPIPE ARRANGEMENT THEREFOR

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 2, 1978, Ser. No. 947,661
Int. Cl.[3] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **8 Claims**



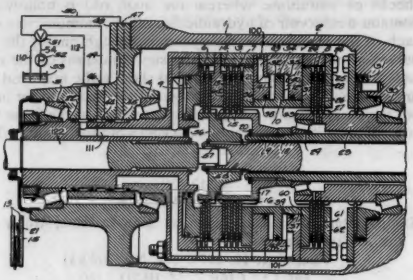
1. A viscous fluid clutch comprising:
a first member secured for rotation with a shaft;
a second member rotatably disposed on said shaft relative to said first member;
shear surfaces disposed on said first and second members and forming an operating chamber therebetween;
a fluid storage chamber adjacent said operating chamber and disposed about the axis of said shaft;
pump means operative to displace fluid from said operating chamber and discharge said fluid within said fluid storage chamber; and
means operative to check the reverse flow of fluid from said fluid storage chamber to said operating chamber through said pump means during periods of relatively low torque transmission through said clutch when substantially all of said fluid is disposed within said storage chamber.

4,312,434

DOUBLE ACTING PISTON FOR HYDRAULIC CLUTCHES

Gerardus M. Ballendux, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 17, 1979, Ser. No. 104,006
Int. Cl.[3] F16D *25/10*
U.S. Cl. 192—87.17 **8 Claims**



1. A double hydraulic clutch system comprising, a first clutch pack and a second clutch pack, a double acting hydraulic actuator disposed between said clutch packs, said hydraulic actuator including a hydraulic cylinder forming a hydraulic chamber, a hydraulic piston extending into said hydraulic chamber to form a first and second fluid pressurizing chamber, a vent passage extending to the periphery of said cylinder and in continuous communication from each of said pressurizing chambers, return springs for centering said piston when pressure is released in said pressurizing chambers, a clutch actuating portion extending from said piston toward each of said clutch packs to selectively and alternatively engage each of said clutch packs, a hydraulic clutch actuating system including a source of pressurized fluid, a reservoir supplying fluid to said source of pressurized fluid, a control valve selectively and alternatively directing pressurized fluid to each of said pressurizing chambers and venting fluid from said chambers to the reservoir for selectively engaging and disengaging said clutches.

4,312,435

SAFETY DEVICES FOR MECHANICALLY OPERATED APPARATUS SUCH AS A PUNCH PRESS

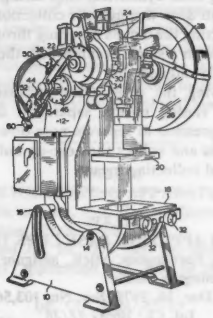
Leslie J. Hollo, Ancaster, Canada, assignor to The Brown Boggs Foundry and Machine Company Limited, Hamilton, Canada

Continuation-in-part of Ser. No. 908,442, May 22, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,564
Int. Cl.[3] F16P *3/00*; F16D *71/00*
U.S. Cl. 192—149 **21 Claims**

1. A safety device for use in combination with mechanically-operated apparatus such as a punch press or the like, the apparatus comprising:
(a) a body;
(b) an operating member movably mounted on the body to perform a work operation;
(c) a power-driven rotatable flywheel mounted by the body and for driving the movable member in such a work operation;
(d) a clutch connecting the flywheel and the movable member for the flywheel to drive the movable member upon actuation of the clutch; and
(e) means for initiating such an actuation of the clutch
the safety device comprising:
(f) a first coupling member adapted for connection with the flywheel to be movable therewith;
(g) a second coupling member normally positionable in a

coupling position for coupling engagement with the said first coupling member;

(h) means for moving one of the coupling members to an uncoupling position upon said initiation of clutch actuation, the thus-moved coupling member returning to the said coupling position before completion of a work operation by the movable member,



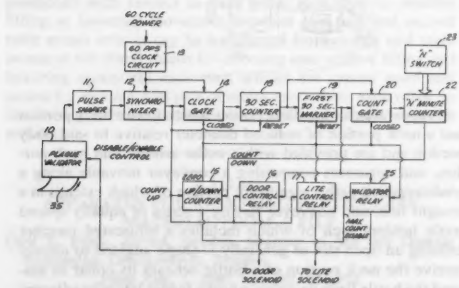
(i) a power-absorbing braking member for connection to the second coupling member and adapted to brake the movement of the operating member upon failure of the coupling members to uncouple, and

(j) a third coupling member positioned for coupling engagement with the said second coupling member to brake the movement of the operating member upon reverse movement of the operating member.

4,312,436
VALIDATOR-CONTROLLED APPARATUS

Robert F. Martin, 18552 Valley Dr., Villa Park, Calif. 23415; Donald A. Eby, 23415 Caminito Lazaro, Laguna Hills, Calif. 92653, and Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027

Filed Jul. 27, 1979, Ser. No. 61,525
Int. Cl.[3] G07F *5/10*
U.S. Cl. 194—4 R **9 Claims**



1. Mechanism for controlling the use of a facility for a predetermined time period in response to receipt and authentication of a valid encoded plaque comprising:

inspection and validator means operable to inspect an encoded plaque of paper currency and to provide an output signal in response to inspection and authentication of a plaque of paper currency;

electronic timer means activated by said output signal and operable to measure a plurality of time periods of different preselected duration;

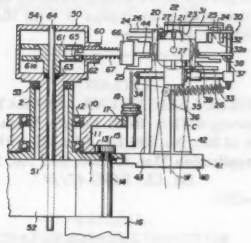
a plurality of power operated components; means connecting said timer means, said inspection and validator means and said power operated components in circuit for use for a respective one of said predetermined time periods upon receipt of an output signal from said plaque inspection and validator means; and

means for disabling said plaque inspection and validator means to receive another plaque during the decrement of an activated predetermined time period and including means for delaying the operation of said disabling means for a short period thereby to provide time for the insertion and processing of an additional plaque into said plaque inspection and validating means.

4,312,437
DEVICE FOR UNLOADING BOTTLE-SHAPED CONTAINERS

Sadao Suzuki, Tokyo; Yoshiyuki Ichizawa, Sohka, and Nobuichi Seki, Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,612
Claims priority, application Japan, Dec. 28, 1978, 53-162046
Int. Cl.[3] B65G *29/00*
U.S. Cl. 198—404 **10 Claims**



1. A device for supplying an injection molded cylindrical piece having a bottom and a neck in neck portion downward position to one of a plurality of orienting jigs comprising:

a turntable turning at constant speed in a predetermined direction;

a plurality of orienting jigs held at equidistant central angles at the peripheral edge of said turntable;

a base plate provided at the side of said turntable;

a support provided on said base plate;

a vertically disposed rectangular overturning plate rotatably secured to the upper portion of said support radially outwardly of said turntable and stoppable at a horizontal position;

overturning means for intermittently rotating said overturning plate 180°;

holders provided at both ends of said overturning plate, said holders being formed substantially by a U shaped upper supporting plate and a lower retaining plate, the distance between said upper and lower plates being approximately that from the neck to the bottom of the piece;

a bracket provided at the upper end of said support and projecting in parallel with said overturning plate and away from said turntable;

a piece supension provided at the end of said bracket and arranged at a position corresponding to said holders, disposed at the bracket end furthest from said turntable when said overturning plate is stopped in horizontal state;

a chute connected to said piece suspension and holding the pieces in neck portion upward position to supply them to the device;

a shaft longitudinally slidable in the radial direction of said turntable, provided substantially directly under said bracket between the ends of said support;

a wire mounted at its one end to the turntable side shaft end and imparted at its other end with a predetermined tension force;

a coil spring mounted at its one end at the shaft end opposite to the turntable and at its other end to said support;

a supporting shaft extending from the end of the shaft mounted with said coil spring;

a guide plate extending toward said turntable from said supporting shaft, said guide plate entering between the first piece and the second piece retained at said piece suspension to urge the first piece into said holder;

rocking means disposed coaxially with said turntable and rocking at the same speed in the same direction as said turntable for a predetermined angle and subsequently returning at least the same speed as said turntable speed to the original position;

a radially reciprocating arm assembled with said rocking means;

arm reciprocating means connected to said arm for positioning said arm at a radially outward limit when said rocking means starts rocking in the direction of said turntable movement and radially reciprocating said arm when said rocking means is near the end of its movement in the direction of said turntable movement;

a hook mounted at the end of said arm for engaging the piece held in neck portion downward position by said overturning plate and dropping it to engage it with the orienting jig disposed directly thereunder.

4,312,438

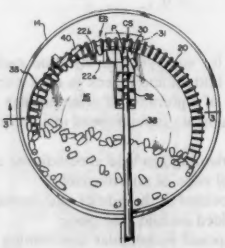
BULLET ALIGNMENT APPARATUS

Marlo K. Vatsvog, 4221 S. 185th, Seattle, Wash. 98188

Continuation of Ser. No. 890,136, Mar. 27, 1978, abandoned. This application Mar. 4, 1980, Ser. No. 127,187

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—392 **8 Claims**



1. Apparatus for aligning bullets of the type having a conical nose and a cylindrical end into a column all pointing the same direction and with the longitudinal axes of all bullets commonly aligned, comprising:

a fixed plate having means defining a gauging surface;

a movable member having a plurality of bullet carrying receptacles;

containment means surrounding said plate and member for holding a supply of bullets in the path of said receptacles;

means for guiding the movable member past said gauging surface with the receptacles closey adjacent the gauging surface;

said plate and receptacles having a downward inclination along the lengthwise axis of the receptacles so that bullets lying in the receptacles will slide by gravity toward the gauging surface;

means for raising the conical nose of a bullet having its conical nose facing the gauging surface above said gauging surface for allowing the bullet to slide by gravity past the gauging surface;

a separation depression in said gauging surface having a lower surface below the longitudinal axis of the bullet but above the lower cylindrical end of the bullet and located just after said conical nose raising means in the direction of member movement so that a conical nose of a bullet facing the depression will slide past the gauging surface out of the receptacle but a cylindrical end facing the depression will abut against the lower surface of the depression and continue to be held in the receptacle;

a collection depression in said gauging surface after the conical nose raising means and separation depression in the direction of member movement and having a lower surface below the cylindrical end of the bullet so that bullets having their cylindrical ends facing the collection depression will drop through the collection depression;

means for collecting the bullets dropping through the collection depression in a single column with their longitudinal axes commonly aligned; and

means for moving the receptacles successively past the conical nose raising means, separation depression and collection depression to separate nose-down bullets from nose-up bullets and collect the nose-up bullets in a single column in said collecting means.

4,312,439

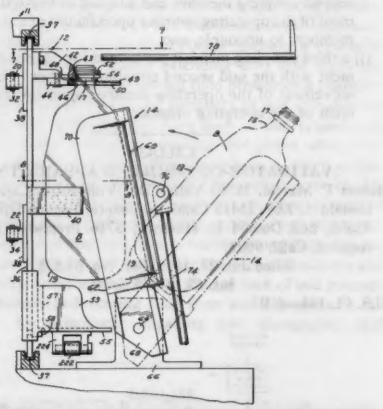
MACHINE FOR APPLYING BASE CUPS TO BOTTLES

William P. Young, Farmington, Mich., assignor to William P. Young Co., Farmington, Mich.

Filed Dec. 14, 1979, Ser. No. 103,566

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—433 **8 Claims**



1. Apparatus for handling bottles which have a body portion and a neck portion of reduced diameter relative to said body portion and are provided with a collar around said neck portion, said apparatus comprising a conveyor movable along a predetermined path a significant portion of which extends in a straight line, said conveyor having a series of equally spaced bottle holders each of which includes a bifurcated member defining an open slot of generally U-shape adapted to closely receive the neck portion of a bottle beneath its collar to suspend the bottle from its collar, a bottle loader laterally adjacent the straight line portion of said conveyor, said bottle loader having a rear wall, a bottom wall, and laterally spaced divider means forming a plurality of individual bottle holding compartments each adapted to receive a bottle in generally upright position with its base supported on said bottom wall, said compartments being arranged side by side in a straight line parallel to the straight line portion of said conveyor path, said compartments being open at the front adjacent the straight line portion of said conveyor, said compartments being open at the top to receive bottles in the retracted position of said loader, means for transferring bottles directly and simultaneously from the compartments of said loader to said bottle holders on the straight line portion of said conveyor, said transferring means comprising means for pivoting said loader from its retracted

position to a transfer position adjacent the straight line portion of said conveyor to transfer the bottles while upright through the open front of said compartments to said bottle holders and by the pressure of the rear wall of said loader against the bottles to force the neck portions of said bottles into the open slots of said bifurcated member so that the bottles are suspended on said bifurcated member by their collars in upright position, and retaining means having a retaining position overlying the open front of said compartments in the retracted position of said loader to retain the bottles in said compartments but not obstructing the open tops of said compartments through which bottles are introduced into said compartments, and means for retracting said retaining means away from its retaining position prior to swinging of said loader to said transfer position.

4,312,440

BRICK SETTING APPARATUS

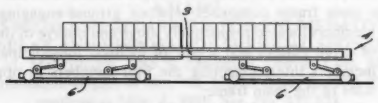
Karl Brugger, Dietenheim, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Jul. 18, 1979, Ser. No. 58,441

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831485

Int. Cl.³ B65G *47/29*

U.S. Cl. 198—458 **9 Claims**



1. Apparatus suitable for use in sequentially spacing apart articles, such as brick mouldings, when in a row comprising first table means for supporting the articles, second table means comprising at least a pair of tables having substantially horizontal support surfaces terminating with sharply defined interior ends, said pair of tables being situated in an end to end relationship for together supporting at least a row of articles following relative vertical movement between said first and second table means, said first and second table means being positioned with respect to each other such that on relative lifting or lowering movement between said first and second table means articles can be transferred from one of said table means to the other, means for effecting said relative lifting and lowering movement each time articles are spaced apart and means for moving said pair of tables away from each other so that such movement produces the desired spacing between the articles.

4,312,441

APPARATUS FOR REMOVING PARTICULATE MATERIAL FROM A PILE

Olof E. Frisk, Järved, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Aug. 1, 1980, Ser. No. 174,318

Int. Cl.³ B65G *65/02*

U.S. Cl. 198—519 **10 Claims**

1. Apparatus for removing particulate material having a volume not exceeding about 0.5 dm^3 from a pile thereof, comprising, in combination,

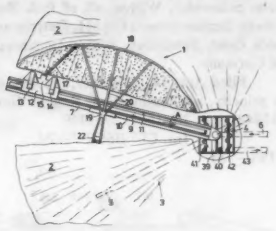
(1) a support extending along the base of the pile;

(2) a carriage movable along the support and carrying;

(3) an elongated scraper for scraping material down from the pile; and

(4) means for collecting and carrying away the material scraped from said pile;

(5) the support having a frame structure fixedly mounted on a central part of the support and extending upwardly towards the pile, the upper end of said frame structure having an arcuate guide which extends outwardly substantially equidistantly from both sides of the frame structure, in a plane which at least approximately coincides with the longitudinal axis of the support; and



(6) the scraper at its lower part being rotatably arranged on the carriage in the plane of the arcuate guide, and in its upper part being movable along the guide when the scraper is rotated about its axis of rotation on the carriage, as a result of movement of the carriage.

4,312,442

SCRAPER-CHAIN CONVEYOR

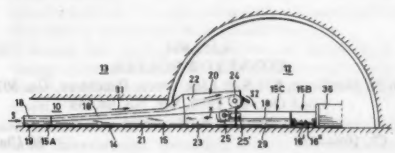
Helmut Temme, Waltrop, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,513

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908155

Int. Cl.³ B65G *19/18*

U.S. Cl. 198—561 **13 Claims**



1. A scraper-chain conveyor for transporting mineral material, comprising:

an endless scraper asaembly constituted by drive chain means with a plurality of scrapers connected thereto, said scraper assembly being arranged to pass around sprocket drums positioned at the ends of the conveyor and having upper and lower runs guided by a plurality of channel sections, at least said upper run having first and second angularly disposed straight portions joined by a curved portion, with the level of said curved portion being lower than that of an adjacent elevated end of said first straight portion;

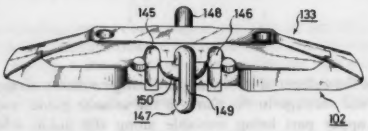
upper and lower deflector rollers positioned to direct said upper run from said elevated end to said curved portion in a vertically aligned generally Z-shaped path, the position of said upper deflector roller being such that mineral material being transported along said first straight section drops from said elevated end onto said upper run at the level of said curved portion for continued transport along said curved portion and said second straight portion, one of said deflector rollers being a drive roller.

4,312,443

SCRAPER FOR CHAINS IN CHAIN CONVEYORS, PARTICULARLY FOR USE UNDERGROUND

Gerhard Niemöller, Waltrop; Wilfried Stromberg, Datteln, and Friedhelm Schneider, Witten, all of Fed. Rep. of Germany, assignors to Becker-Prunte GmbH, Datteln and Stahlhammer Bommern Gebr. Schneider, Witten-Bommern, both of, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,461
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717448; Apr. 20, 1977, 2717449
Int. Cl.³ B65G *19/24*
U.S. Cl. 198—731 6 Claims



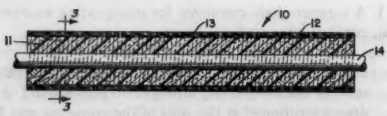
1. Scraper for chain belts on scraper conveyors, particularly for mining and tunnelling operations, which has an upper part which can be bolted onto a lower part, and where the upper and lower parts interlock and are subdivided by centrally arranged beds each for one flat link of a double central chain, where the beds are arranged next to each other and have channels separated by a bar, as well as being separated from each other by a central bar, characterised in that the central bar **(111)** is designed to take one flat link **(150)** of a central chain, and that the central bar **(111)** and the bars **(115, 116)** which separate the channels **(113, 114; 117, 118)** of the beds for the double central chain are equipped with supporting sections **(121-124; 119, 120)** on their end faces, to support rounded sections of perpendicular links **(157-160; 148, 149)** connected to the embedded links.

4,312,444

CONVEYOR ROLLER

John N. Mushovic, 516 Salt Lick Trace, Peachtree, Ga. 30269

Filed Oct. 12, 1979, Ser. No. 84,459
Int. Cl.³ B65G *39/06*
U.S. Cl. 198—780 36 Claims



1. A conveyor roller having a low noise level and a long wear life comprising:

(1) a central shaft;

(2) an intermediate layer composed of a polymeric material bonded to the shaft;

(3) a hard wear element positioned around the periphery of the intermediate layer and having a pre-determined thickness; and

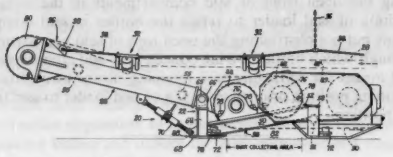
(4) an outer layer composed of an abrasion-resistant polymeric material bonded to the intermediate layer and to the wear element and having a thickness substantially equal to the thickness of the hard wear element, whereby the hard wear element produces a long wear life and the polymeric materials produce a low noise level.

4,312,445

BELT CONVEYOR TANDEM DRIVE ASSEMBLY WITH GROUND LEVEL CLEAN-OUT CLEARANCE

Robert C. Nelson, Bluefield, W. Va., assignor to Mining Machinery Development Corp., Daniels, W. Va.

Filed Jun. 23, 1980, Ser. No. 161,765
Int. Cl.³ B65G *23/04, 21/00*
U.S. Cl. 198—835 3 Claims



1. In a belt conveyor, a tandem drive assembly for an endless conveyor belt which is orbitally movable along a conveying course, the drive assembly comprising a main frame and an elongated boom at the outbye end of the main frame, a pair of belt drive pulleys mounted in tandem on the main frame and located respectively inbye and outbye of one another and rotatable about spaced parallel axes which are in a first common inclined plane, and a direction-reversing head pulley at the outbye end of the boom, the improvement wherein:

the main frame comprises separate ground-engaging foot members located respectively inbye and outbye of the pair of drive pulleys and a pair of inclined longitudinal side members interconnecting the foot members at opposite sides of the main frame;

the foot members having skid means at their bottom ends directly engageable with the ground;

the inclined side members having upper surfaces which are in a second common inclined plane parallel to the first common inclined plane, and rotary bearings for the drive pulleys being supported on the upper surfaces, the upper surfaces being positioned to support the inbye drive pulley at a higher level than the outbye drive pulley; and

the inclined side members having lower surfaces elevated above the ground to provide ground level clearance through the sides of the main frame for access to the area beneath the drive pulleys thereby facilitating clean-out of dust and fines deposited there by the conveyor belt.

4,312,446

BASKET CARRIER

Gus E. Summers, Cincinnati, Ohio, assignor to The C. W. Zumbiel Company, Cincinnati, Ohio

Filed Dec. 20, 1979, Ser. No. 105,535
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—185 18 Claims

1. A basket carrier comprising

opposed first and second side walls, and opposed first and second end walls, same defining the outside walls of said carrier,

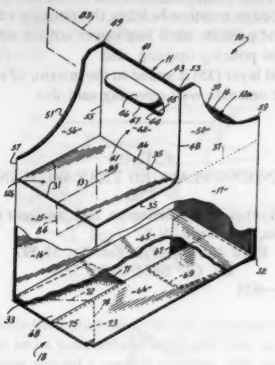
a handle panel located generally normal to said side walls when said carrier is set up,

a first handle connector panel generally coplanar with said first side wall when said carrier is set up, said first handle connector panel being foldably connected to said handle panel at one side edge thereof, said first handle connector panel extending only from said handle panel toward said first end wall, and

a second handle connector panel generally coplanar with said second side wall when said carrier is set up, said second handle connector panel being foldably connected to said handle panel at the other side edge thereof, said second handle connector panel extending only from said handle panel toward said second end wall,

said handle panel and both said handle connector panels

cooperating to establish a generally square Z-shaped configuration where the handle connector panels are not



opposite one another when the set-up carrier is viewed in top view.

4,312,447

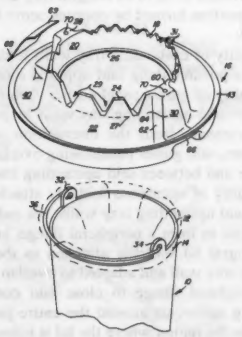
METHOD AND APPARATUS FOR ENUMERATIVE DISPLAY AND DISPOSAL OF SURGICAL SPONGES

Rose M. McWilliams, 1065 S. Josephine, Denver, Colo. 80209

Continuation-in-part of Ser. No. 17,903, Mar. 5, 1979. This application Mar. 4, 1980, Ser. No. 127,121

Int. Cl.[3] **A61B** *19/00*; **A61F** *13/00*

U.S. Cl. 206—370 **9 Claims**



1. A used surgical sponge display device whereby enumerative display of used surgical sponges is enhanced comprising:

first means including an upwardly extending annular central portion having a notched upper surface with a predetermined number of spaced notches thereon for retaining used surgical sponges to facilitate their identification as to number, said annular central portion having opposed inner and outer sidewalls extending downwardly therefrom to define a channel, each said notch being defined by a pair of opposite side surfaces and a base surface extending between opposed side surfaces;

second means including a fluid receiving portion extending circumferentially around and extending outwardly from said annular central portion for collecting and retaining the fluid from the retained used surgical sponges; and

third means inwardly of said annular central portion and including an inner container portion having sidewalls extending downwardly from said inner sidewall of said annular central portion and a bottom for receiving and retaining said sponges and fluid from said retained sponges on said notches.

4,312,448

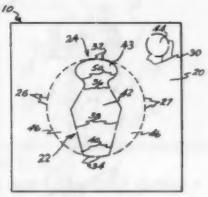
STATION WIRE BOX WITH INSERT

James J. Pelster, Sidney, Nebr., assignor to Eltra Corporation, Toledo, Ohio

Filed Jan. 24, 1980, Ser. No. 114,853

Int. Cl.[3] **B65D** *85/671*

U.S. Cl. 206—409 **4 Claims**



1. A package of linear flexible material comprising:

a coil of linear flexible material;

a container having a first face and a second face, said first and second faces being disposed parallel to said coil and on opposite sides of said coil;

said first face having an aperture therein and a tubular insert disposed perpendicular to said first face in said aperture, said insert extending inwardly from said first face towards said second face;

said insert having a length of approximately one half of the distance between said first and second faces;

said insert including a flange portion disposed on an exterior surface of said first face, and a tapered portion disposed adjacent to an interior surface of said first face, said tapered portion having a larger end thereof disposed adjacent said first face;

said flange portion and said tapered portion defining a groove interposed between said flange portion and said tapered portion for cooperating with said aperture in said first face to retain said insert in said first face;

said second face having first perforations therethrough defining a first portion, to be removed and to allow manual access to said coil to pass an end thereof through said insert;

said second face further having second and third perforations therethrough, encircling said first perforations and having; second and third portions adapted to be removed, said second and third portions being contiguous with said first portion;

said first, second and third portions together defining a removable circular portion;

said package being adapted to alternatively dispense said end of said linear flexible material through said insert and through the circular aperture formed by removing said removable circular portion when the first face and insert are damaged.

4,312,449

APPARATUS FOR THE DISPLAY OF GOODS

John Kinderman, 300 French Rd., Newtown Square, Pa. 19073

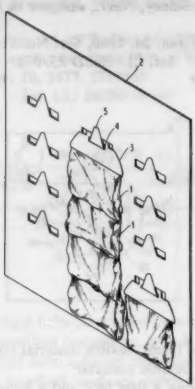
Filed Apr. 9, 1980, Ser. No. 138,694

Int. Cl.[3] **B65D** *73/00, 85/62*

U.S. Cl. 206—466 **3 Claims**

1. Apparatus for display of articles, comprising a backing card and a plurality of tabs to which said articles may be affixed, said card being formed identically at each of an equal plurality of locations to comprise a tongue and to remove two substantially symmetric sections of said card disposed on either side of each of said tongue, said tabs having slots formed

therein sized to mate with said tongues, and shoulders formed on either side of said slots, said shoulders being sized to fit said removed sections so that only the portion of each said tab containing said shoulders can protrude through said removed sections, each said tongue fitting said card such that said



tongue must be bent in a direction away from a first side of said card so as to permit said tongue to be inserted in a slot in a tab, whereby said shoulders may protrude through said removed sections in a direction away from the second side of said card, whereby removal by dislodgement of said tabs from said card is prevented.

4,312,450

OPENING MEANS FOR PACKAGING CONTAINERS

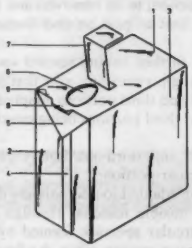
Wilhelm Reil, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to Tetra Pak Development S.A., Switzerland

Filed Feb. 14, 1978, Ser. No. 877,675

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.³ B65D *5/72*

U.S. Cl. 206—605 **6 Claims**



1. In a container made from folded flexible material, and intended to package pourable products, the container having a top wall **(1)** and at least one side wall **(2)** connected to the top wall along a fold line **(9)**, a pouring opening **(6)** in the top wall adjacent the one side wall, and a cover strip **(7)** attached to the top wall on the opposite side of the opening from the fold line, the cover strip extending across the opening toward the fold line when in position to cover the opening; the improvement comprising

a slot **(18)** formed in said one side wall spaced from said fold line and terminating at its opposite edges **(19)** at said fold line defining a pouring edge member **(8)** movable from a first position extending along said one side wall to a pouring position extending approximately in the plane of said top wall and outwardly from said fold line,

said cover strip projecting across said fold line and over said pouring edge member holding the pouring edge member in its first position until said cover strip is moved to uncover the pouring opening, and

a fluid-tight layer **(15)** is sealed to the interior of said top wall and said one side wall covering said slot.

4,312,451

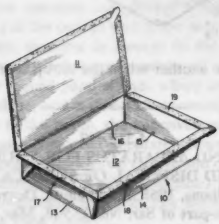
SELF STANDING FLANGED TRAY WITH INTEGRAL LID

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,397

Int. Cl.³ B65D *5/66, 5/24*

U.S. Cl. 206—628 **2 Claims**



1. A container for packaging, storing, displaying and heating food prepared from a single blank of flexible material such as coated paperboard to form an integral tray and lid comprising:

(a) a base portion formed by opposed score lines in the blank material;

(b) a plurality of upstanding tray walls foldably attached to said base portion along said opposed score lines;

(c) a plurality of gusset panel corner closures foldably connected to said upstanding tray walls by paired score lines which emanate from the intersection of said opposed score lines, said gusset panels being overlappingly bonded together and between said upstanding tray walls;

(d) a plurality of extensions foldably attached to all except one of said upstanding tray walls, the ends of which abut each other to form a peripheral flange; and,

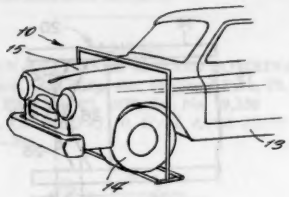
(e) an integral lid foldably attached to the remaining upstanding tray wall and adapted to overlap and be sealed to said peripheral flange to close said container, said lid including microcuts around the entire periphery thereof except in the region where the lid is joined to the remaining upstanding tray wall to permit the paperboard to delaminate from the lid to the peripheral flange when the container is opened, and a container opening tab located along an edge thereof remote from the connection of the lid to the said remaining upstanding tray wall for opening said container, the improvement wherein the paired score lines which connect the remaining upstanding tray wall to its adjacent tray walls are oriented to that one score line of each pair is a straight extension of the opposed score line between said base portion and said remaining upstanding side wall and the other score line of each pair diverges from the opposed score lines between said base portion and the adjacent tray walls to produce a tray in which all except said remaining upstanding tray wall are divergent with respect to said base portion which permits the tray portions of separate containers to be nested when empty and the sealed containers to be self standing along said remaining substantially straight and nondivergent upstanding tray wall for display after being filled and closed.

4,312,452

VEHICLE THEFT PROTECTION DEVICE

Vincent J. Waier, 1435 Sheffield, Saginaw, Mich. 48603

Filed May 2, 1980, Ser. No. 145,990
Int. Cl.³ B60R 25/00; B60T 3/00; E05B 65/12, 65/19
U.S. Cl. 211—23 1 Claim



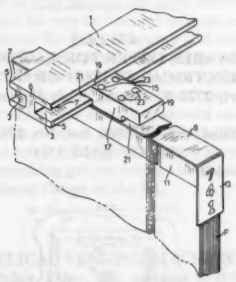
1. A vehicle theft protection device, comprising, in combination, a base, and a yoke affixed upon said base, so as to form an upright frame around a central opening, into which a vehicle can be driven, so that wheels of said vehicle rest upon said base, while said frame surrounds said vehicle; said frame being telescopically adjustable in size; said base comprising a pair of parallel, spaced-apart bars, secured at opposite ends to downward legs of said yoke, a rotatable roller around each said bar, and means for selectively locking said rollers from rotation around said bars, said means comprising a plurality of radially extending holes through each of said rollers, which are selectively aligned with a transverse hole in each said bar, and a removable pin being inserted through said aligned holes.

4,312,453

FILE HANGING SYSTEM

Donald T. Barber, Toronto, Canada, assignor to Datafile Limited, Willowdale, Canada

Filed Aug. 31, 1979, Ser. No. 71,549
Int. Cl.³ A47F 7/16
U.S. Cl. 211—46 9 Claims



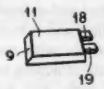
1. A file hanging system consisting of file edge backing means provided with a T-shaped member comprising a central column positioned at a point of balance on said file edge backing means and a pair of arms projecting outwardly in opposing directions from said central column and bracket means provided with a U-shaped groove for engaging either of the arms of said T-shaped member, the arrangement being such that when said T-shaped member is inserted in said U-shaped groove, the weight of a file on which said file edge backing means is secured moves the T-shaped member to a locking engagement in said U-shaped groove regardless of its direction of insertion into said bracket means.

4,312,454

MODULAR CONSTRUCTION ELEMENT FOR BUILDING A PIGEONHOLE-TYPE WALL

Carlo Steffen, 16 F, rue de la Fontenette, 1227 Carouge, Switzerland

Filed Apr. 17, 1980, Ser. No. 141,155
Claims priority, application Switzerland, Apr. 24, 1979, 3813/79
Int. Cl.³ A47B 73/00, 53/00
U.S. Cl. 211—74 6 Claims



1. A modular construction element for building a pigeonhole wall, said element having:

a planar front face and parallel thereto a planar back face flanking a plane between and parallel to said faces;

a rectangular back panel defining said back face and lying between said back face and said plane, said back panel having an upper back-panel edge, a lower back-panel edge generally parallel to said upper back-panel edge, and a pair of parallel side back-panel edges bridging said upper and lower edges, said back panel being formed along the full length of said lower edge with a planar chamfer forming with said plane an angle of generally 45° open toward said upper back-panel edge;

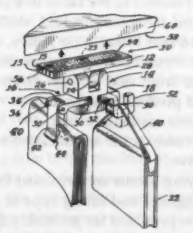
a front panel defining said front face and lying between said front face and said plane, said front panel being subdivided at a line equidistant between and parallel to said back-panel side edges into a right section and a left section, said right section having right-section upper and lower edges coextensive with said back-panel upper and lower edges between said line and one of said side edges, said left section being geometrically identical to said right section but offset along said line relative thereto, said left section having an upper left-section edge spaced upwardly beyond said upper back-panel edge and a lower left-section edge spaced upwardly from said lower back-panel edge, whereby a recess is defined between said left-section lower edge, said line, the other side edge, said back-panel lower edge between said line and said other side edge and said plane, said left section having an upper portion projecting beyond said back-panel upper edge and complementary to said recess.

4,312,455

TABLE PARCEL HOLDER

Cora Weber, 7650 W. Farragut Ave., Chicago, Ill. 60656

Filed Jan. 21, 1980, Ser. No. 114,014
Int. Cl.³ A47F 5/00
U.S. Cl. 211—86 1 Claim



1. A holding device for supporting articles underneath the top of a dining table, comprising an attaching member for

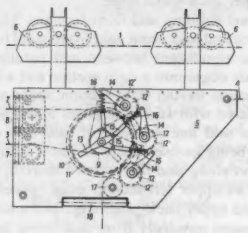
attachment to a surface beneath the table top, a body having one or more holding members for supporting said articles, connecting means for pivotally connecting said body to said attaching member, said attaching member comprising a rectangular element having a pair of parallel opposing faces, one of said faces being engaged by said connecting means, and an adhesive covering the other of said faces, said rectangular element being pivotally secured to said connecting means, the face opposite said adhesively covered face being reticulated along the longitudinal axis of said element, said means connecting said body to said attaching member comprising at least one ear on said attaching member and at least one ear on said body, and a pivot member coupling said ears together, whereby said attaching member is pivotable with respect to said body to permit the attachment of said attaching member to a horizontal or vertical surface of the table, and whereby said pivotable securement and said reticulated face permit said element to be attached to an arcuate surface of said table.

4,312,456

ROPEWAY CRANE

Heimo Neuhold, Kärnten, Austria, assignor to Reinhold Hinteregger Maschinen- und Seilbahnbau, Villach, Austria

Filed Jun. 10, 1980, Ser. No. 158,177
Claims priority, application Austria, Jun. 11, 1979, 4158/79
Int. Cl.³ B66C *11/20*
U.S. Cl. 212—96 **6 Claims**



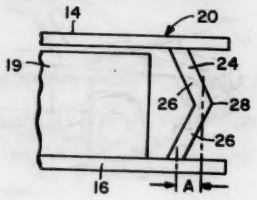
1. In a ropeway crane, comprising
a carrying rope,
a running gear guided by and movable along said carrying rope,
a crane housing connected to said running gear,
a pullback rope secured to said crane housing and operable to pull the latter along said carrying rope,
a shaft mounted in said crane housing,
a lifting rope pulley formed with a peripheral groove and mounted on said shaft,
a lifting rope trained around said lifting rope pulley in said groove and adapted to be paid out from said lifting rope pulley by a rotation of the latter in a predetermined sense,
a storage drum mounted on said shaft and nonrotatably connected to said lifting rope pulley, and
a payout rope wound on said storage drum and operable to be unwound from said storage drum so as to rotate the same in said predetermined sense,
the improvement residing in that
at least one pressure roller is associated with said lifting rope in said groove,
pressure-applying means are provided for forcing said pressure roller against said lifting rope in said groove, and
drive means are provided for positively driving said pressure roller at a peripheral velocity which is equal to the peripheral velocity of said lifting rope in said groove as said payout rope is unwound from said storage drum.

4,312,457

HOUSING STRUCTURES FOR EVACUATED DEVICES

Roger A. Allaire, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,681
Int. Cl.³ H01J *5/03*
U.S. Cl. 220—2.1 R **8 Claims**



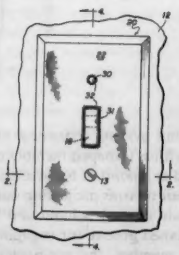
1. In an enclosing housing structure having opposed vitreous front and back panels joined together by a plurality of separate vitreous sidewall panels wherein the structure is subjected to a subatmospheric or evacuated environment and must withstand the forces generated thereon by atmospheric pressure when the interior thereof is so evacuated, the improvement comprising separate vitreous sidewall means extending between said opposed front and back panels for altering the stress distribution within said structure from that obtained with perpendicular sidewalls and for maintaining the maximum stress levels generated within such panels by atmospheric pressure to within commercially safe acceptable stress limits, said sidewall means including a plurality of skew glass sidewall panels formed separately of said opposed panels and having outer end portions terminating adjacent opposed surfaces of said opposed front and back panels, adjacent sidewall panels being sealed to each other, said skew sidewall panels being hermetically sealed at their outer ends to surface portions of said opposed front and back panels inwardly of the periphery of said opposed panels, and said skew sidewall panels having an outer portion which is offset within a plane perpendicular to at least a portion of one of said opposed panels with respect to a line lying within such plane and passing through the hermetic seal formed at said sealed ends.

4,312,458

REMOVABLE COVER FOR FACEPLATE OF ELECTRICAL SWITCH OR OUTLET

Gloria Stewart, 2772 E. 75th St., Unit 5F South, Chicago, Ill. 60649

Filed Aug. 18, 1980, Ser. No. 178,872
Int. Cl.³ N02G *3/14*
U.S. Cl. 220—241 **6 Claims**



1. A removable cover for the faceplate of a wall-mounted electrical switch or outlet wherein the faceplate has apertures therethrough for switch levers and fasteners and the like, said

cover comprising a decorative fabric pouch having front and rear panels and four edges, three of said edges being permanently closed, a flap which is foldable rearwardly to close the open edge of the pouch, said front panel covering the outer surface of the associated faceplate, said rear panel covering the opposite surface of the associated faceplate, said panels having openings therein respectively substantially congruent with the apertures in the associated faceplate.

4,312,459

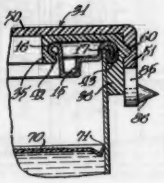
PAINT CAN RIM COVER AND LID COMBINATION

Albert E. Leach, 1924 Ridge Rd., Highland Park, Ill. 60035

Filed Sep. 27, 1979, Ser. No. 79,338

Int. Cl.³ B65D *43/10, 41/62, 43/06, 25/10*

U.S. Cl. 220—256 **1 Claim**



1. A paint can rim cover and lid combination for use with a paint can having a rim with inner and outer peripheral beads and an intermediate annular groove defining a top opening for the can comprising, an annular rim cover of molded plastic material having a generally L-shaped cross section to provide inner and outer circular flanges in spaced parallel depending relation with an interconnecting base having a planar upper surface with said circular flanges extending generally normal thereto, each of said flanges extending downwardly relative to a paint can and having an inwardly facing annular groove intermediate the height thereof to snap onto and fit around the inner and outer peripheral beads of the rim with the interconnecting base spanning the groove of the rim for sealing of said groove and with the outer circular flange having a width to extend downwardly along the side of the paint can, a lid of molded plastic material having a circular planar panel section and a depending peripheral flange with said panel section having a diameter at least equal to the outer diameter of the rim cover whereby said lid may be fitted on said rim cover with the depending peripheral flange overlapping and extending along said outer circular flange and with said planar panel section in a circular area of contact with the upper surface of the rim cover base, and interlocking means of said rim cover and lid including a protruding bead extending around said outer circular flange of the rim cover at a location to be below the top of the paint can and reinforced against inward movement by the paint can and a matching groove formed in an inner face of the depending peripheral flange of the lid.

4,312,460

HELICAL VENDING MACHINE

William C. Boettcher, Foley, Mo., assignor to D.O.V.E. Equipment Corporation, Winfield, Mo.

Continuation-in-part of Ser. No. 35,421, May 2, 1979, Pat. No. 4,258,860. This application Apr. 14, 1980, Ser. No. 139,991

Int. Cl.³ G07F *11/36*

U.S. Cl. 221—75 **5 Claims**

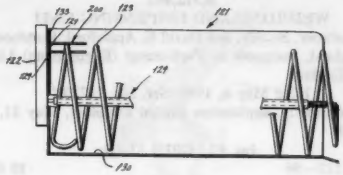
1. A vending machine item discharge unit comprising:

(a) a tray means having side, rear and bottom walls,

(b) helical means having a plurality of convolutions along its length to retain articles to be dispensed in the convolutions,

(c) drive means connected to the helical means to rotate said helical means in predetermined increments upon activation by a customer, and

(d) restraining means positioned within the helix and being of sufficient width to engage the underside of the rearmost convolution of the helix at two points as the helix is at the apex of its rotation and is most spaced from the bottom



wall of the tray to hold the said rearmost convolution above the bottom wall of the tray to reduce friction therebetween and to restrict sidewise movement of the rear end of the helix.

4,312,461

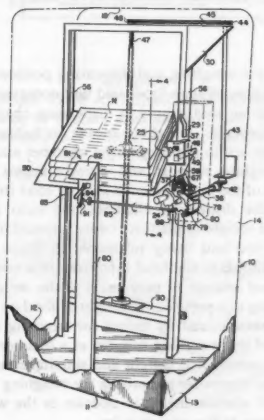
NEWSPAPER VENDING MACHINE

Fred O. Godley, Sr., 611 Oakdale Rd., Charlotte, N.C. 28216

Filed Jun. 25, 1980, Ser. No. 162,938

Int. Cl.³ G07F *11/48*

U.S. Cl. 221—195 **9 Claims**



1. In a single copy newspaper vending machine having a cabinet within which a supply of newspapers is placed for sequential dispensing and having a dispensing mechanism activated by a coin operated release mechanism, said dispensing mechanism comprising a newspaper supply platform including an angularly disposed surface extending upwardly and rearwardly and on which the supply of newspapers is positioned with one flat side of the newspapers facing downwardly and the folded edge of the newspapers facing forwardly of the machine, a dispensing wedge including a vertical base mounted in said cabinet in front of the platform and engageable with the folded edges of the supply of newspapers, an upwardly and rearwardly inclined face on the top of the vertical base of said dispensing wedge, means to raise the platform, means responsive to insertion of a coin in the machine to activate said means to raise the platform and the newspapers thereon along the vertical base until the upper-most newspaper rises over the inclined face of the dispensing wedge, a dispensing chute aligned with the inclined face of the dispensing wedge to define a path of travel for the newspaper after it moves across the inclined face of the dispensing wedge, and means in the

path of travel of a dispensed newspaper for locking said means to raise the platform.

4,312,462

WEIGHING AND DISPENSING UNIT

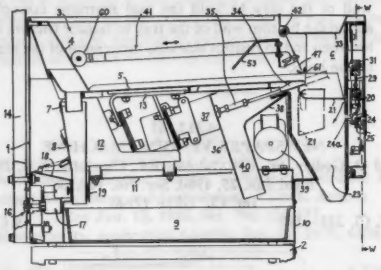
Keith Faulkner, Bexley, and David E. Appleford, Romford, both of England, assignors to Portionmat (Engineering) Limited, Kent, England

Filed May 6, 1980, Ser. No. 147,241

Claims priority, application United Kingdom, May 11, 1979, 16592/79

Int. Cl.³ G01G *13/00*

U.S. Cl. 222—56 **10 Claims**



1. A unit for weighing and dispensing portions of flowable food for a supply of such food, said unit comprising a receptacle for receiving said supply, a dispensing chamber opening into said receptacle, weighing means including a weighing platform disposed in said dispensing chamber and carried by a movable weighing support, and vibrator means coupled to a bottom wall of the receptacle for feeding food from the receptacle, into the dispensing chamber and onto the weighing platform, the weighing platform being retained in one position to receive food and being releasable to move into another position to discharge the food therefrom in accordance with a predetermined amount of movement of the weighing support corresponding to a preselected weight of food on the weighing platform, characterized by means for stopping the weighing movement of the weighing support at a location prior to the point of the preselected weight and simultaneously the vibrator means and thereafter permitting the weighing movement to continue and vibrator means to operate or the weighing platform to release as the case may be.

4,312,463

PROPORTIONAL PUMPING APPARATUS

Lance H. Daby, 12202 Woodbine, Detroit, Mich. 48239

Filed Feb. 4, 1980, Ser. No. 118,500

Int. Cl.³ B67D *5/56, 5/52;* F04B *23/06*

U.S. Cl. 222—134 **5 Claims**

1. Proportioning apparatus comprising:

a first container of a first liquid and a second container of a second liquid;

first pump means for receiving the first liquid from the first container, said first pump means having a first movable pumping member;

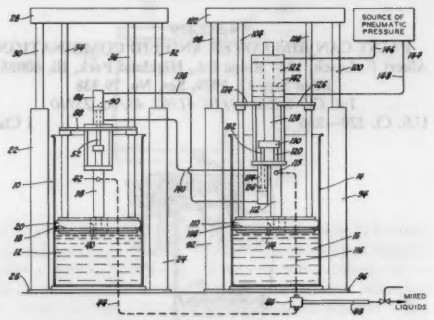
second pump means for receiving the second liquid from the second container, said second pump means having a second movable pumping member, the first pumping member being movable in a first stroke and the second pumping member being movable in a second stroke;

a motor connected to the first pumping member for moving same in said first stroke;

a master hydraulic cylinder connected to the motor, and a piston disposed in the master hydraulic cylinder so as to be actuated in a driving motion according to the motion of the first pumping member;

a slave hydraulic cylinder, and a piston in the slave hydraulic cylinder connected to the second pumping member so as to be movable therewith;

conduit means including hydraulic fluid connecting the master hydraulic cylinder and the slave hydraulic cylinder



such that the piston of the slave hydraulic cylinder is moved according to the motion of the piston in the master hydraulic cylinder; and

mixer means for receiving the first liquid from the first container and the second liquid from the second container as the motor is actuated to simultaneously remove the first liquid from the container of said first liquid and the second liquid from the container of said second liquid.

4,312,464

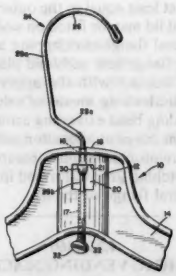
LATCHABLE GARMENT HANGER

Alfred A. Treiman, 1519 Easterly Ter., Los Angeles, Calif. 90026

Filed May 28, 1980, Ser. No. 154,160

Int. Cl.³ A47J *51/098*

U.S. Cl. 223—85 **5 Claims**



1. A latchable garment hanger, comprising:

a hook member having a hook portion and an elongated shaft portion;

a hanger body having a bore extending therethrough for receiving said elongated shaft portion;

means for permitting substantially free swivelling movement of said shaft within said bore while permitting only limited axial movement thereof; and

latching means extending into the opposite end of said bore from said elongated shaft, said latching means being axially moveable within said bore to selectively engage and disengage said shaft, wherein said latching means is operative to prevent swivelling movement of said shaft when

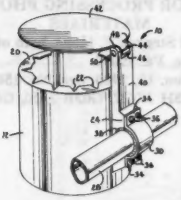
said latching member and shaft are in their engaged positions.

4,312,465

HANDLEBAR MOUNTED CAN HOLDING DEVICE

Herman L. Sinkhorn, P.O. Box 665, King City, Mo. 64463, and George T. Sinkhorn, Rte. 1, Box 1B, Mound City, Mo. 64470

Filed Oct. 10, 1980, Ser. No. 195,793
Int. Cl.³ B65D *25/00;* B62J *7/06*
U.S. Cl. 224—36 2 Claims



1. A can holding device attachable to a handlebar for holding beverage cans of various sizes, said device comprising:

a hollow body of sufficient size to accommodate beverage cans of various sizes therein with an inserted can projecting upwardly out of the body, said body terminating in an upper rim;

a bottom surface of said body for receiving the bottom of an inserted can;

yieldable means on said body for resiliently contacting the side wall of an inserted can around the periphery thereof in a manner holding the can against lateral movement in the body;

clamp means for securing said body to the handlebar;

a stanchion extending from said body above the upper rim thereof;

a lid mounted on said stanchion at a location spaced above said rim for pivotal movement between a lowered position wherein the lid engages the top of an inserted can to hold the can against said bottom surface and a raised position wherein the lid is disengaged from the can to permit removal of same from said body; and

detent means for temporarily holding said lid in the lowered position and in the raised position.

4,312,466

PISTOL HOLSTER WITH ADJUSTABLE SAFETY STRAP

Earl J. Clark, Anaheim, Calif., assignor to Tandy Brands, Inc., Fort Worth, Tex.

Filed Apr. 18, 1980, Ser. No. 141,583
Int. Cl.³ F41C *33/02*
U.S. Cl. 224—243 4 Claims

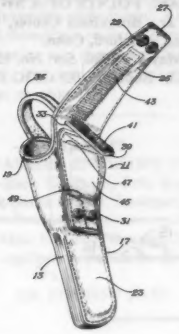
1. An improved holster, comprising in combination:

a body folded over and secured to define a pocket for receiving a pistol, the body having inner and outer portions, the inner portion being worn next to the user;

the inner portion including a flap depending from the top of the inner portion, the flap having a lower end releasably secured by snap fasteners to the inner portion, the inner portion having a slot at its top;

a safety strap extending through the slot with an inner end on the inner side, the strap adapted to extend over the pistol, defining a loop and terminating in an outer end that is releasably secured to the outer member by snap fasteners;

a pair of strips of material that adhere to each other when pressed together, one strip being secured to the inner side of the flap and the other to the strap adjacent its inner end, the strips being of sufficient length to allow adherence at selected distances from the inner end to the top of the inner portion to vary the dimensions of the loop defined by the safety strap; and



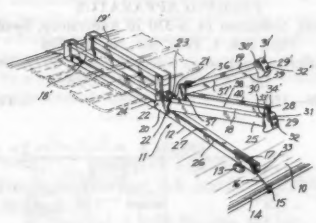
a belt loop secured to the inner portion inside of the flap.

4,312,467

DOUBLE TIER AUTOMOTIVE SKI RACK

Richard Kulwin, 40 Bedford Rd., Armonk, N.Y. 10504

Filed Jan. 12, 1981, Ser. No. 224,629
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—315 8 Claims



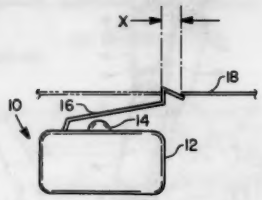
1. A double tier automobile ski carrier comprising, in combination, a frame member, mounting means on said frame member for securing said member to the roof of an automobile, said frame member having an upwardly directed ski support surface, a first pair of hold-down arms connected to said frame member substantially medially thereof for pivotal movement about pivot axes normal to said frame member whereby said arms are shiftable between a carrying position in proximate parallel spaced relation to said support surface of said frame and a loading position angularly offset from said support surface, a second pair of hold-down arms, pivot means interposed between each of said second pair of hold-down arms and said frame for supporting said second pair of hold-down arms for pivotal movement toward and away from an arm of said first pair between a carrying position in proximate parallel spaced relation to an arm of said first pair and a loading position angularly offset from an arm of said first pair, cushion means on said support surface, the upper and lower surfaces of said arms of said first pair and the lower surface of said arms of said second pair, and lock means for releasibly securing said first and said second pairs of arms in said carrying position.

4,312,468

SYSTEM AND APPARATUS FOR COMPENSATING FOR THE DIFFERENCE BETWEEN THE ACTUATION AND RELEASE POINTS OF A SWITCH

Robert J. Tolmie, Jr., Brookfield Center, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 15, 1980, Ser. No. 150,104
Int. Cl.³ B65H *25/00*; G03G *15/00*
U.S. Cl. 226—9 **4 Claims**



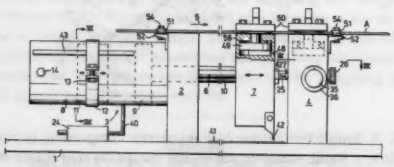
1. A system that compensates for difference between the actuation point and the release point of a switch that is actuated by a document moving thereacross, comprising: a switch, delay means coupled to said switch, said delay means being operative to send an initially high signal that decreases in value, a comparator in electrical connection with said delay means, a reference signal means, operative to send a reference signal to said comparator and a load in electrical connection with said comparator wherein said comparator compares the output from said delay means with said reference signal and becomes enabled when said signal from said delay means is of a value lower than said reference signal to thereby send an actuating signal to said load.

4,312,469

FEEDING APPARATUS

Rune Nilsson, Storgatan 14, S-330 20 Anderstorp, Sweden

Filed Feb. 1, 1980, Ser. No. 117,508
Claims priority, application Sweden, Feb. 7, 1979, 7901054
Int. Cl.³ B65H *17/44, 17/36*
U.S. Cl. 226—150 **14 Claims**



1. An apparatus for intermittently feeding an elongate workpiece stepwise in its longitudinal direction in a given path, comprising

a frame structure having fixedly mounted thereon a first stationary clamping means and an attachment means arranged in spaced relationship with said first clamping means;

second clamping means arranged for rectilinear movement between said attachment means and said first clamping means, said first and said second clamping means being so arranged that the movalbe clamping means advances said workpiece when moving in one direction but not when moving in a direction opposite to said one direction;

a piston-cylinder device having a piston rod connected at one end thereof to said second clamping means for effecting movement of said means laong said workpiece's longitudinal direction;

end plate means displaceably arranged in the cylinder of said piston-cylinder-device such as to enable the volume of said cylinder to be changed;

a clamping ring displaceably arranged on the outer wall of said cylinder such as to enable said clamping ring to be moved into register with the peripheral surface of said end plate, and

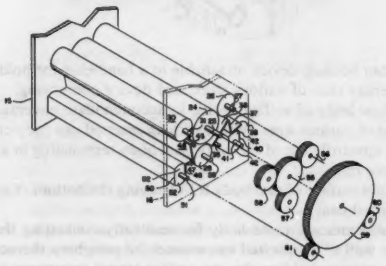
means co-acting with said clamping ring to clamp said ring about said cylinder wall and thus also about said peripheral surface of said end plate means.

4,312,470

APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIALS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Jun. 10, 1980, Ser. No. 158,260
Int. Cl.³ B65H *17/22*; G03B *1/56*; G03D *3/08*
U.S. Cl. 226—183 **16 Claims**



1. In apparatus for processing photographic materials by conveying an elongated web for turnaround in a confined space comprising

spaced frame members,

means carried by said spaced frame members for directing the web in an arcuate path,

said means comprising web guide plates for engagement by the web mounted for oscillatory movement, and

members for oscillating said web guide plates.

4,312,471

FOOT POWERED TUFTING MACHINE

Arthur J. Randolph, P.O. Box 1541, Santa Rosa, Calif. 95405

Filed Sep. 4, 1979, Ser. No. 72,070
Int. Cl.³ A41H *37/10*
U.S. Cl. 227—15 **2 Claims**

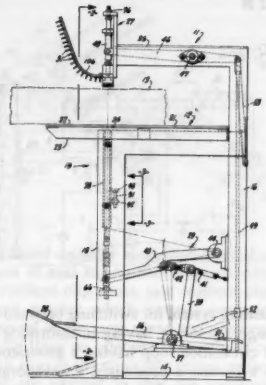
1. A foot powered tufting machine adapted to engage male and female button parts through a pad or the like comprising

a female button drive mechanism including a retractable needle adapted to extend through a female button part and a moveable carriage carrying said needle, said female button mechanism including a pair of vertical tracks mounting said carriage in slidable relation therebetween a needle block slidably disposed on said carriage and mounting said needle in extension upwardly from the carriage through an apertured needle guide, a spring urging said needle block downwardly on said carriage to retract said needle into said guide, a pawl pivotally mounted on said carriage for normal engagement with said needle block to hold same against said spring, and a stop secured to said track in position for engagement by said pawl adjacent the upper end of carriage travel to pivot the pawl and release the needle block for retracting the needle into said guide after the needle and a female button part are driven through a pad to be quilted so that a male button part may be driven into the female button part,

a male button drive machanism including moveable button

support means and a drive shaft for engaging a male button part disposed on said support means, and

actuating means including a pivotally mounted foot operated lever linked to a pivotally mounted arm coupled to said moveable carriage and a second pivotally mounted arm engaging said drive shaft and having a drive rod extending therefrom for operative engagement by said foot operated lever at the terminal portion of the pivoting movement of said lever,



said actuating means including a drive link pivotally connected to said arm pivotally connected to an upright on said foot operated lever and disposed to be rotated as said lever is pivoted for substantial movement of said carriage during initial lever movement and minimal movement of said carriage during terminal lever movement whereby pivoting of said lever first moves said female button drive mechanism and subsequently moves said male button drive mechanism.

4,312,472

THUMBTACK TACKER

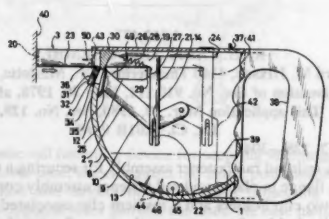
Tsunehito Okuda, 42 Morishita-cho, Higashi-ku, Nagoya-shi, Aichi-ken 461, Japan

Filed Jan. 15, 1980, Ser. No. 112,317

Claims priority, application Japan, Jan. 22, 1979, 54-6335

Int. Cl.³ B25C *1/02*

U.S. Cl. 227—113 **4 Claims**



1. A thumbtack tacker tacking thumbtacks by pushing action comprising:

(a) a case provided with an arc-shaped housing portion for holding a plurality of thumbtacks inside the case;

(b) an arm having a V-shaped pick-up member pivotally mounted in said case for picking up a thumbtack inside said arcshaped housing portion along the arc-shaped face of said arc-shaped housing portion

(c) a working slide slidably supported in said case, said working slide having a suspended portion engaging said arm wherein, when said working slide slides in said case, the front end of the arm moves along said arc-shaped housing portion;

(d) a reversing plate pivotally mounted on said arcshaped portion, said reversing plate having a magnet thereon for attracting said thumbtack picked up by said pick-up member, and positioning said thumbtack in front of said working slide, such that said working slide can drive said thumbtack into an object.

4,312,473

TWO-CHAMBER ENVELOPE PACKAGE

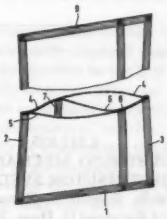
Hans Hoeller, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,283

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 7908132[U]

Int. Cl.³ B65D *25/08*

U.S. Cl. 229—56 **4 Claims**



1. A two-chamber flat envelope having first and second outer walls of equal length and a separating partition disposed therebetween and joined together therewith in the edge areas thereof, characterized in that the said partition is coextensive with said length of said outer walls and joined to said first outer wall by a first seam along its length at a predetermined distance from a first edge and joined to said second outer wall along its length by a second seam at a predetermined distance from a second edge located opposite said first edge.

4,312,474

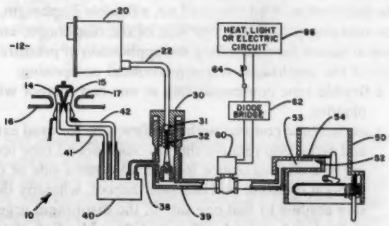
POSITIVE SHUTOFF

David Tulowiecki, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,424

Int. Cl.³ F24F *7/06*

U.S. Cl. 236—49 **4 Claims**



1. A positive shutoff for an air distribution unit of a central air conditioning system comprising:

bellows controlled damper means for controlling the flow of conditioned air into an area in accordance with the degree of inflation of said bellows;

regulator means for supplying control air to said bellows to

cause said bellows to inflate in accordance with the pressure of said control air;

bleed-type thermostatic means operatively connected to said regulator means via a fluid path for controlling the pressure of said control air in response to the setting of said thermostatic means to thereby control the inflation of said bellows by controlling bleeding of said control air;

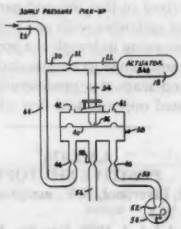
normally open valve means located in said fluid path intermediate said regulator means and said thermostatic means;

circuit means operatively connected to said valve means for causing said valve means to close in response to a condition existing in said circuit means to thereby prevent said thermostatic means from bleeding said control air whereby said bellows inflates to prevent the flow of conditioned air into an area independent of the setting of said thermostatic means without otherwise disabling the central air conditioning system.

4,312,475
FLOW ADJUSTMENT MECHANISM FOR AIR DISTRIBUTOR SYSTEMS

Douglas F. Edwards; Ronald S. Zimmer, both of Jackson County, Mo., and Raymond H. Dean, Johnson County, Kans., assignors to Tempmaster Corporation, Kansas City, Mo.

Filed Oct. 27, 1980, Ser. No. 201,226
Int. Cl.³ F24F 7/06
U.S. Cl. 236—49 **14 Claims**



8. In an air distribution system controlled by a pneumatic circuit of the type having an inflatable bladder for controlling the distribution of conditioned air, a flexible diaphragm, means for applying pressure to one side of the diaphragm, and thermostat means for controlling the application of pressure to one side of the diaphragm, the improvement comprising:

a flexible tube communicating at one end thereof with said bladder;

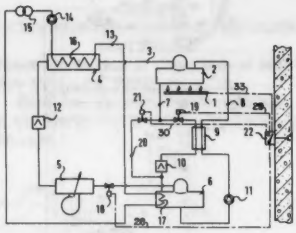
a second tube coupled with said first tube for axial extension and retraction relative thereto, said second tube terminating in a control orifice located adjacent a side of the diaphragm opposite said one side thereof, whereby the pressure applied to said one side of the diaphragm urges same toward said control orifice to reduce bleeding of pressure from the bladder; and

adjustment means for extending and retracting said second tube relative to said first tube to vary the distance between said control orifice and diaphragm, thereby adjusting the amount of pressure required against said one side of the diaphragm to effect a predetermined condition of inflation of the bladder.

4,312,476
BIVALENT HEATING SYSTEM

Erich Pohlmann, Kulmbach, Fed. Rep. of Germany, assignor to ASK August Schneider GmbH & Co. KG, Kulmbach, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,530
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758773
Int. Cl.³ G05D 23/00
U.S. Cl. 237—2 B **2 Claims**



1. Bivalent heating system for switching between heat pump and heat exchanger operation, having an absorption heat pump with a coolant circulation loop having a generator being directly fired by a burner, a condenser, an evaporator and an absorber disposed therein, first heat exchanging means, an outgoing and a return line connected from the generator to the absorber through the first heat exchanging means, second heat exchanging means disposed in the coolant circulation loop, and a heating medium loop for space heating being coupled to the coolant circulation loop through the second heat exchanging means, comprising first valve means disposed in the coolant circulation loop for interrupting the flow therethrough, throttling means, a bypass line being connected upstream of said throttling means in coolant flow direction, having second valve means and shunting the evaporator, third valve means disposed in the outgoing line for interrupting flow therethrough, and temperature switch means for sensing ambient temperature and operating said first, second and third valve means for switching coolant flow from heat pump operation through the coolant circulation loop to heat exchange operation through part of the outgoing line, said bypass line, the absorber, the return line and the generator when a predetermined low ambient temperature is reached and for increasing fuel supply to the burner when switching to heat exchange operation.

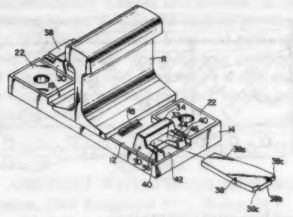
4,312,477
RAIL FASTENER ASSEMBLY

Richard M. Hixson, 4140 Thunderbird Dr., Marietta, Ga. 30067

Continuation of Ser. No. 910,111, May 30, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,490
Int. Cl.³ E01B 9/48
U.S. Cl. 238—304 **9 Claims**

1. A railroad rail fastener assembly for securing a rail having a base flange in place, said rail fastener assembly comprising at least two clip holders and a resilient clip associated with each said clip holder for engaging the base flange of the rail to secure the rail in place; each said resilient clip comprising an elongate substantially planar member including a rail engaging, proximal end and said clip holders each including means defining an aperture therein through which the associated clip extends and which defines a fulcrum for said clip, and clip supporting and constraining means, including an integral upwardly facing support surface whose height relative to said aperture provides for capture of the distal end of the associated clip between said surface and said aperture defining means so that said clip can be deflected about said fulcrum, for supporting and constraining the distal end of said clip such that the

said rail engaging proximal end of said clip is deflected when in engagement with said rail and thereby biased into engagement therewith, said support surface gradually sloping upwardly in a direction away from said rail and comprising the upwardly facing surfaces of a pair of spaced integral leg members which extend in a direction away from the rail, said leg members including means for fixing the position of said resilient clip relative to said support surface, said position fixing means



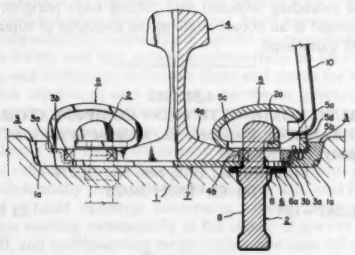
comprising a raised shoulder located on each of said upwardly facing surfaces of said leg members against which the distal end of said resilient clip abuts, said resilient clip including a central tongue portion which extends outwardly from the distal end thereof in the same plane and portions of the distal end of said clip lying on opposite sides of said central tongue portion which engage the upwardly facing surfaces of said leg members and are adapted to abut the corresponding raised shoulders on the upwardly facing surfaces of said leg members.

4,312,478

ELASTIC RAIL FASTENING DEVICE

Yoshio Matsuo, and Kentaro Matsubara, both of Tokyo, Japan, assignors to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 53,985
Claims priority, application Japan, Feb. 10, 1979, 54-13854
Int. Cl.³ E01B *9/66*
U.S. Cl. 238—349 **16 Claims**



11. An elastic rail fastening device for securing an elongated rail to a concrete base, the elongated rail being positionable on top of the base and having bottom flanges projecting outwardly from opposite sides thereof, the concrete base having a shoulder thereon which is spaced sidewardly from the rail so that the shoulder faces but is spaced from the opposed side edge of the base flange, a metal spike embedded in the concrete base and projecting upwardly therefrom in sidewardly spaced relationship from the base flange so that the spike is interposed between the base flange and the shoulder, said spike having a head portion defining thereon a downwardly-directed support surface, and a spring receiver removably fitted to the concrete base in sidewardly spaced relationship from the bottom flange so that the spring receiver bears against the shoulder, the spring receiver having an inner side surface which is disposed opposite but spaced outwardly from the side edge of the base flange, the spring receiver and shoulder having a cammed relationship therebetween so that the spacing between the side edge of the flange and the inner side surface of the spring receiver varies in response to the position of the spring receiver on the base, the improvement wherein said fastening device comprises:

first spring means for imposing a downwardly-directed holding force against the upper surface of the base flange, said first spring means comprising a first spring member having a first portion thereof disposed in bearing engagement with and imposing a downwardly-directed force against an upper surface formed on said spring receiver, a second portion disposed in bearing engagement with the upper surface of said base flange for imposing a downwardly-directed force thereagainst, and a third portion disposed in bearing engagement with the downwardly-directed support surface formed on said spike;

said head portion being integrally and fixedly associated with said spike so that said first spring member reacts between said spike and said base flange without requiring use of a removable or threaded head portion on the spike; and

second spring means coacting with the base flange of the rail for transmitting sidewardly-imposed external forces on the rail directly to the shoulder on the base without imposing these sidewardly-directed forces on the spike, said second spring means comprising a second spring member which is wholly independent of said first spring member and is capable solely of transmitting sidewardly-directed forces from the rail to the shoulder;

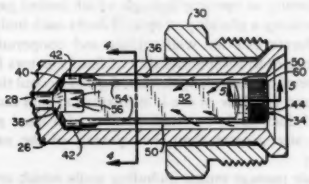
said second spring member including a first part disposed in bearing engagement with the inner side surface of said spring receiver, and a second part disposed in bearing engagement with the inner edge of said rail flange, said second spring member being free of connection with said spike to prevent the sidewardly-directed forces transmitted through said second spring member from being imposed of said spike.

4,312,479

FUEL INJECTION NOZZLE WITH EDGE FILTER

Lewis E. Tolan, Simsbury, Conn., assignor to Stanadyne, Inc., Hartford, Conn.

Filed Feb. 19, 1980, Ser. No. 122,008
Int. Cl.³ F02M *49/02*
U.S. Cl. 239—86 **7 Claims**



1. In a fuel injection nozzle for delivering pulsed charges of liquid fuel under high pressure to the cylinder of an associated engine and having a fuel inlet passageway for connection to a fuel supply line, the inlet passageway having a cylindrical edge filter mounting bore at the upstream end thereof, and a generally cylindrical one-piece metal edge filter nested in said cylindrical bore and having an even plurality of angularly spaced and axially extending filtering edges cooperating with said cylindrical bore to provide restricted circumferential filtering passages therebetween, the edge filter forming with the cylindrical bore a plurality of angularly spaced and axially extending alternating inlet and outlet channels intermediate the filtering edges and in communication with the inlet passageway

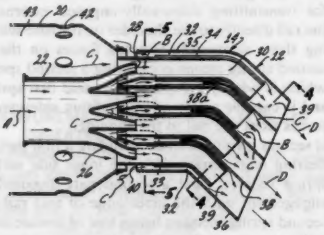
respectively upstream and downstream of the edge filter, the improvement wherein the edge filter has a plurality of generally cylinder sector locating guides at the upstream ends of the outlet channels respectively, said sector locating guides having upstream knurled edge sections with an axial knurl thereon in interference fit engagement with said cylindrical bore for retention of the edge filter upon axial insertion of the edge filter therein, the sector locating guides having filtering edge sections downstream of the knurled edge sections respectively with a greater radius than said filtering edges for locating the edge filter and for edge filtering any interference fit debris from axial insertion of the edge filter into the cylindrical bore.

4,312,480

RADIATION SHIELDING AND GAS DIFFUSION APPARATUS

Robert C. Miller, Encino, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Filed Nov. 26, 1979, Ser. No. 97,130
Int. Cl.³ F02K 1/00
U.S. Cl. 239—127.3 **21 Claims**



1. A device for shielding a heated surface from infra-red detection through an opening adjacent to the heated surface comprising:

a gas-conducting member adapted to receive heated gases from the opening;

said member having an exterior surface imperforate along its length, an interior surface, an inlet for receipt of heated gases, and an outlet for discharge of gases;

said member having a configuration which blocks said inlet from line-of-sight view through said outlet;

said member including means forming a plurality of nozzles each having an opening through which heated gases flow;

means forming a plurality of spaced ducts each including an imperforate exterior wall surface and cooperating with said nozzles to form a plurality of fixed ejectors for intermixture of cooling air with heated gases to cool the heated gases and for flow of the intermixture to said outlet;

each said duct having a fixed opening of a fixed predetermined size greater than the opening of the associated nozzle;

cooling air passage means including walls which are imperforate along their length positioned between said ducts and cooperating with each said duct and said exterior surface of said member to cool the exterior surface of each said duct and the exterior surface of said member by passage of cooling air thereover;

means for creating a region of reduced pressure for drawing cooling air into said cooling passage means;

means forming a cooling air inlet for said cooling passage means and a discharge therefor; and,

means forming a cooling air inlet for said ducts and a discharge therefor,

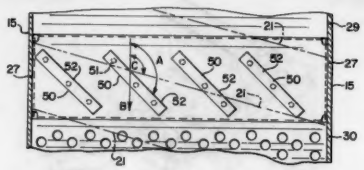
whereby the heated gas in each said duct is cooled by admixture with cooling air while the exterior surface of said member and said duct is cooled by cooled air flowing through said cooling passage means.

4,312,481

CUTTERHEAD CROP REDIRECTORS

Thomas A. Carey, Plainfield, and Elmer M. Kesl, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,180
Int. Cl.³ B02C 18/22
U.S. Cl. 241—101.7 **6 Claims**



1. A forage harvester comprising:

a mobile frame;

a housing mounted on the frame having a forwardly opening crop inlet and a rearwardly disposed crop outlet;

a rotary reel cutterhead rotatably mounted on a transverse axis within said housing between said crop inlet and said crop outlet, said cutterhead including a plurality of knives mounted in fixed position therein and having cutting edges disposed at an obtuse angle to the direction of rotation such that upon rotation, the cutting edges of the knives generate a cylindrical periphery;

a single stationary shear bar extending transversely across the width of said cutterhead in coacting relation therewith and mounted in said housing on the crop inlet side thereof;

an imperforate shield disposed adjacent the periphery of said cutterhead extending from said shear bar in the direction of rotation;

a perforated recutter screen in adjacent peripheral relation to said imperforate shield in the direction of rotation, a portion of said screen being in coacting shearing relation with said cutterhead; and

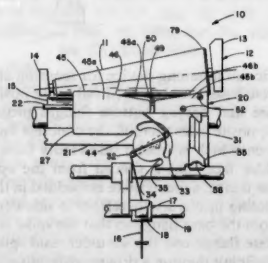
a raised elongated bar mounted on said imperforate shield and extending adjacent said cutting edge periphery and disposed at an obtuse angle to the direction of rotation of said cutterhead.

4,312,482

AUTO-LOADING TENSION COMPENSATOR

Richard A. Schewe, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sep. 24, 1979, Ser. No. 78,279
Int. Cl.³ B65H 59/26
U.S. Cl. 242—154 **11 Claims**



1. An auto-loading tension compensator for use in winding a strand upon a package, said compensator comprising a fixed axis, a member rotatable about said axis, said member having a

pair of projections spaced from said axis and having respective smooth thread-engaging surfaces, means for biasing said member to rotate in a predetermined direction about said axis, and a stop for limiting rotation of said member in the predetermined direction, wherein the improvement comprises:

a strand guide having a guide surface spaced from said projections for maintaining the strand in a path displaced forwardly from said projections in the direction of said axis and for positioning the strand for loading;

means for selectively rotating said member in opposition to said biasing means to a strand-loading position; and

means for releasing the strand from said guide surface when said member is in said strand-loading position so that the strand lies between said projections and is engageable by said projections when said member rotates in response to said biasing means.

4,312,483

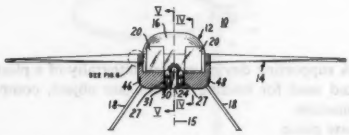
AIRCRAFT WITH CIRCULAR WING

Nicolae Bostan, 2344 Kingsland Ave., Bronx, N.Y. 10469

Filed Oct. 13, 1978, Ser. No. 951,198

Int. Cl.³ B64C *29/04, 17/06*

U.S. Cl. 244—12.2 **5 Claims**



1. An aircraft for vertical, horizontal, or stationary flight, comprising a wing member and a fuselage member centrally mounted in said wing member, said fuselage member including propulsion means, aerodynamically active flight control means, and means for operating said propulsion and flight control means, said wing member comprising a disk substantially larger than said fuselage and having a substantially vertical axis, said disk being arranged for rotation about said axis with respect to said fuselage, said disk and propulsion means being arranged so that said disk has substantially neutral lift characteristics when rotated, said disk being substantially free of aerodynamically active flight control or propulsion members, whereby said disk provides substantially no lift or thrust during said vertical or stationary flight and means for rotating said disk relative to said fuselage, thereby to gyroscopically stabilize the attitude of said aircraft, said propulsion means comprising a reaction motor having a first exhaust opening for providing a first thrust component along said disk axis and a second exhaust opening for providing a second thrust component substantially perpendicular to said disk axis, said first and second exhaust openings comprising tubular passages, said passages meeting substantially at the center of gravity of said aircraft, and said operating means including means for controlling flow of reaction motor exhaust gases through said exhaust openings thereby to control the relative magnitude of said thrust components.

4,312,484

INFLATABLE FLOW CONTROL

David J. Meisner, Monmouth Beach, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 4, 1979, Ser. No. 36,124

Int. Cl.³ B64C *25/56*

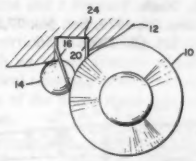
U.S. Cl. 244—17.17 **5 Claims**

4. A helicopter float assembly comprising:

a multi-chambered inflatable fluid holding helicopter float adapted to be mounted on a helicopter;

a multi-chambered inflatable fluid holding helicopter float positioning log in juxtaposition to said inflatable helicopter float and operably associated therewith at points of contact between the exteriors thereof to position said float with respect to the helicopter, said float and said log having fluid communicating openings therebetween at said points of contact to communicate each helicopter float chamber having a fluid communicating opening with a corresponding chamber of the helicopter float positioning log; and

flow control means disposed in each fluid communicating opening between said helicopter float chambers and said helicopter float positioning log chambers to permit the inflation of said helicopter float positioning log through



said helicopter float but to restrict the flow of fluid from said helicopter float positioning log to said helicopter float, said flow control means including a base member disposed over the fluid communicating opening between said helicopter float chambers and said helicopter float positioning log chambers having an opening coextensive with the fluid communicating opening and a flapper member having a bleed opening therein affixed to two opposed edges to said base member but otherwise free to extend outward from said base member when said helicopter float positioning log is inflated from said helicopter float.

4,312,485

LANDING GEAR WITH SWING-BAR AND LATERAL LIFTING FOR AIRCRAFT

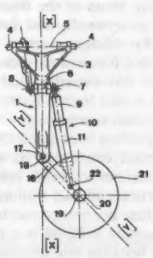
Jean Masclet, Paris, and Andre Turiot, Morsang sur Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Dec. 26, 1979, Ser. No. 107,877

Claims priority, application France, Dec. 29, 1978, 78 36807

Int. Cl.³ B64C *25/12*

U.S. Cl. 244—102 R **6 Claims**



1. A main landing gear for an aircraft having a longitudinal plane of symmetry, comprising:

a leg having a first plane of symmetry perpendicular to the longitudinal plane of symmetry of the aircraft, said leg having at one end thereof two articulated points of connection to the aircraft disposed on opposite sides of the first plane of symmetry, and said leg having at its other end a first axis which is transverse to the first plane of symmetry;

a swing bar having a second plane of symmetry and having one end articulated to said other end of said leg for rota-

tion about said first axis, said swing bar having a second axis forming an axis of rotation, said second axis being parallel to said first axis and lying in said second plane of symmetry;

rolling means mounted on said second axis; and

a shock absorber having one end thereof connected with said swing bar at a point displaced from the two ends thereof and lying in said second plane of symmetry.

4,312,486

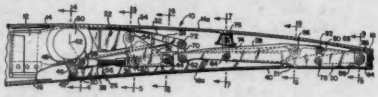
VARIABLE CAMBER TRAILING EDGE FOR AIRFOIL

Maurice E. McKinney, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 20, 1979, Ser. No. 77,333

Int. Cl.³ B64C 3/50

U.S. Cl. 244—215 **14 Claims**



1. A variable camber airfoil comprising:

a. a support frame,

b. upper and lower skins attached to said frame,

c. a trailing edge end section,

d. a variable camber upper skin section extending from said frame to said trailing edge end section,

e. a variable camber lower skin section extending from said frame to said trailing edge end section,

f. a walking beam positioned between the upper and lower variable camber skin sections, said walking beam comrpising a forward positioning section and a rearwardly extending locating arm,

g. positioning means to locate said forward positioning section of the walking beam relative to said frame, said positioning means comprising:

(1) a first forward connecting means interconnecting a forward connecting portion of the positioning section of the walking beam to said frame for movement of the forward connecting portion back and forth on an upwardly and forwardly directed path,

(2) a second rearward connecting means interconnecting a rearward connecting portion of the positioning section of the walking beam to the frame for movement back and forth on an upwardly and rearwardly directed path, whereby said positioning section is constrained to move in a manner that forward movement thereof rotates said locating arm downwardly, and rearward movement thereof rotates said locating arm upwardly,

h. a whiffle tree beam comprising:

(1) a forward portion connected to said frame,

(2) a rear portion connected to said trailing edge end section in a manner to permit relative rotation between said rear portion and said trailing edge end section,

(3) an intermediate portion connected to said locating arm at an intermediate location in a manner to permit relative rotation between said intermediate portion and said locating arm,

i. a tilting arm compring:

(1) a forward portion connected to said locating arm at an end location positioned rearwardly of said intermediate location in a manner to be rotatable with respect to said locating arm,

(2) a rear portion connected to said trailing edge section in a manner to cause said trailing edge end section to be rotatable with said tilting arm

whereby downward and upward rotational movement of the locating arm of the walking beam causes a corresponding downward or upward rotational movement of the whiffle tree beam and the tilting arm of a correspondingly greater degree of rotation relative to said locating arm, with the tilting arm rotating to a greater degree relative to the whiffle tree beam.

4,312,487

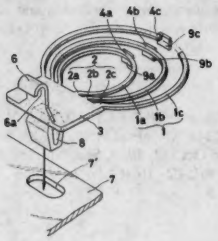
PLASTIC DEVICE FOR SUPPORTING PIPES, CORDS AND OTHER ELONGATE OBJECTS

Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jul. 28, 1980, Ser. No. 172,926

Int. Cl.³ F16L 3/08

U.S. Cl. 248—73 **3 Claims**



1. A supporting device molded integrally of a plastic material and used for binding an elongate object, comprising in combination:

a base piece,

an engaging portion provided on said base piece,

a plurality of looped strips of successively greater sizes having the respective opposite terminals thereof joined integrally into said base piece, said plurality of looped strips being arranged gradually outwardly in the increasing order of their sizes from the smallest looped strip in the innermost position, and

engaged portions provided one each at the outermost portion of said looped strips and adapted each to come into fast engagement with said engaging portion.

4,312,488

CLAMP FOR SECURING ARTICLES OF ROUND CROSS SECTION

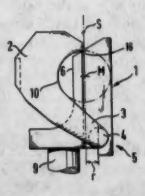
Claude Pierron, Le Hameau Fleuri Villa, France, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,310

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830096

Int. Cl.³ F16L 3/08

U.S. Cl. 248—74 R **10 Claims**



1. A one-piece clamp for grasping elongated articles of generally round cross section, comprising:

an abutment body having a substantially planar clamping surface and having front and rear portions with respect to the direction of insertion of an article into the clamp,

at least one J-shaped clamping jaw having one end portion forming a curved clamping surface, said surface being

formed substantially as an arc of a circle, and another end portion for mounting to said abutment body,

at least one resilient pivot projecting from the rear portion of said abutment body for pivotally mounting said another end of the jaw to said abutment body, said pivot being integral with said jaw and said abutment body,

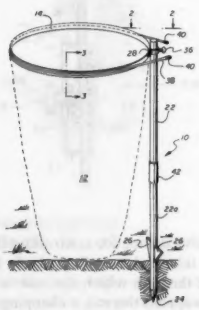
Wherein the rotational axis of said pivot is parallel to the axis of an article caught between said clamping surfaces, said jaw being biased into clamping relationship by said resilient pivot, and wherein said rotational axis lies along the projection of said planar clamping surface, or outside said projection with respect to said curved clamping surface.

4,312,489

BAG HOLDER FOR COLLAPSIBLE BAGS

William F. Paetzold, 13919 Bay Tree Dr., Sugar Land, Tex. 77478

Filed Oct. 9, 1979, Ser. No. 82,770
Int. Cl.³ A63B *55/04*
U.S. Cl. 248—97 **9 Claims**



1. A bag holder for supporting collapsible bag, comprising:

(a) a continuous support ring for supporting said collapsible bag when said bag is inserted into said support ring and the bag mouth is folded over said support ring and retained thereby, said support ring including an outer surface having upper and lower ends and an upper ring edge extending outwardly from said upper end; in the plane defined by said support ring to form a corner between said outer surface and said upper ring edge;

(b) a support pole for supporting said ring, said pole having a pointed end to facilitate easy insertion into the ground;

(c) a bracket attached to said ring, said support pole extending therethrough to support said ring in an orientation normal to said pole; and

(d) a resilient band adapted to be positioned about said support ring to retain said folded over collapsible bag mouth against said outer surface below said upper ring edge in position about said ring.

4,312,490

MUSIC STAND EXTENDER

Americole R. Biasini, 2101 Ontario St., Bellingham, Wash. 98225

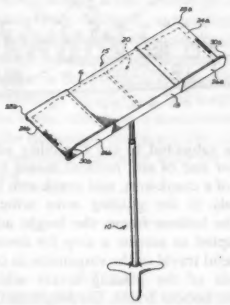
Filed Jun. 16, 1978, Ser. No. 916,204
Int. Cl.³ A47B *19/00*
U.S. Cl. 248—542 **4 Claims**

1. An extension device adapted to enlarge the surface contact support area of a music stand, said music stand having a generally vertically aligned back support panel having a front side and a back side and a generally horizontally aligned support flange affixed to a lower edge portion of said back support panel, said support flange having an upper side and a lower side, said extension device being adapted to slidably engage music stands of conventional construction without requiring structural changes thereto or additional attaching members thereon, said extension device comprising:

a. a planar panel portion having an upper edge and a lower edge, said panel portion being adapted to be positioned against a surface of said back support panel with the upper edge of the panel portion being closely adjacent an upper edge of the back support panel, and with the lower edge of the panel portion being positioned closely adjacent a lower edge of said back support panel,

b. a flange portion adapted to be positioned against a surface of said music stand support flange, said flange portion having a rear edge connected to the lower edge of the panel portion and a forward edge,

c. an upper retaining flange connected to the upper edge of the panel portion and extending downwardly therefrom to define with an upper portion of said panel portion an upper vertical retaining groove to receive an upper vertical portion of the music stand support panel in frictional engagement,



d. a first lower retaining flange connected to the forward edge of the flange portion and extending rearwardly therefrom to define with the flange portion a lower horizontal retaining groove to receive said music stand support flange in frictional engagement,

e. said extension device having a retracted position where said panel portion overlies said back support panel and an extended position where inner portions of the extension device overlap outer portions of said music stand back support panel and said music stand support flange to provide support for said extension device, whereby, said extension device may be retained in said retracted position when an enlarged surface area is unnecessary for conventional music sheets or books, and said device may be moved to said extended position to enlarge the support surface when oversized sheets or books of music are to be used, said extension device permitting a musician to utilize a single music stand instead of two or more music stands.

4,312,491

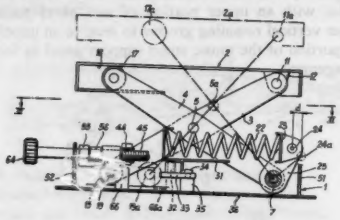
DEVICE FOR THE RESILIENT SUSPENSION OF VEHICLE SEATS

Bernard Aondetto, Nogent sur Marne, France, assignor to Sable Freres International, Pantin, France

Filed Jan. 24, 1980, Ser. No. 114,843
Claims priority, application France, Feb. 2, 1979, 79 02715
Int. Cl.³ F16M *13/00*; B60N *1/02*
U.S. Cl. 248—575 **7 Claims**

1. A device for the resilient suspension of a vehicle seat, comprising a bottom frame to be mounted on the vehicle, a top frame on which the seat is to be mounted, means for guiding the vertical displacements of the top frame with respect to the bottom frame, said guiding means being constituted by levers of the scissors type pivotally attached at one end respectively to the bottom frame and to the top frame whilst the other ends

of said levers are caused to slide respectively in horizontal guides of said frames, resilient means applied against the bottom frame and attached to the top frame in order to urge said top frame in the upward direction, means for adjusting the flexibility of the resilient means according to the weight of the user, and height adjustment means for vertical location of the useful travel of the suspension according to the height of the user, wherein the means for adjusting the flexibility of the resilient means and the height adjustment means are constituted by two horizontal systems associated mechanically in series, the height adjustment means being applied against the bottom frame whilst the flexibility adjustment means are applied against the height adjustment means, one end of the resilient means being applied against an adjusting reduction-



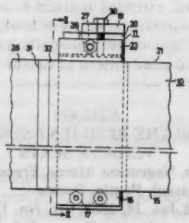
lever which is subjected to the flexibility adjustment means whilst the other end of said resilient means is applied against the crank-pin of a crank-arm, said crank-arm being coupled to the lower ends of the guiding arms which are pivotally mounted on the bottom frame, the height adjustment means being also adapted to actuate a stop for determining the top level of the useful travel of the suspension in cooperation with the lower ends of the guiding levers which are slidably mounted on the bottom frame, the length of the crank-arm as well as the mechanical advantage of the adjusting reduction-lever being such that the two ends of the resilient means undergo a displacement in the same direction and to the same extent in respect of a movement of any amplitude of said height adjustment system.

4,312,492

ARRANGEMENT IN SLIPFORMS

Allan Andersson, Vellinge, Sweden, assignor to Interform Brödrene Pedersen AB, Vellinge, Sweden

Filed Oct. 10, 1980, Ser. No. 195,764
Claims priority, application Sweden, Oct. 12, 1979, 7908487
Int. Cl.³ E04G *11/22, 13/02*
U.S. Cl. 249—20 **7 Claims**



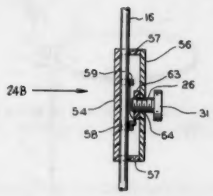
1. In a slipform arrangement comprising a plurality of oblong, substantially rectangular mold plates arranged sequentially in a manner such that their end portions overlap each other there is provided an elongate post-like mold plate support means adjacent a short edge of an associated mold plate such as to support said plate in spaced relationship therewith, thereby to leave a gap for accommodating an end portion of a sequential mold plate, and tensioning means for creating in the region of said short edge a tensioning force directed substantially in the long direction of the post-like mold plate support.

4,312,493

APPARATUS FOR CONTROLLED LIQUID ADMINISTRATION

Rita A. Stauffer, 1016 W. Hollywood St., Chicago, Ill. 60660

Continuation-in-part of Ser. No. 38,000, May 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 801,810, May 31, 1977. This application Aug. 18, 1980, Ser. No. 178,934
Int. Cl.³ F16K *7/06;* A61M *5/00*
U.S. Cl. 251—8 **3 Claims**



1. In a clamp valve device for controlling the flow of liquid through a flexible tube and including a body formed to define a through passage through which the tube is to extend when the valve device is appied thereto, a clamping member threadedly mounted in said body on one side of said passage intermediate the ends of said passage and extending normally thereof and movable, along an axis extending normally of said passage, toward the tube, when in the passage, to engage a side portion of the tube for constricting the tube, and away from the tube for releasing the tube, and a valve seat aligned with said axis and opposing said clamping member across the through passage against which the clamping member when rotated in its clamping direction compresses the tube to constrict the bore of same for controlling the flow of liquid therethrough,

the improvement wherein:

said body defines a chamber about said axis adjacent the valve seat that is intersected by the through passage,

and including a C-shaped clamping spring disposed in said chamber in a plane that is normal to said axis and extends longitudinally of said passage,

said spring being substantially centered on said axis,

said spring defining a bight portion that is apertured in alignment with said passage, to receive said tube on one side of said axis, and a pair of opposed end portions on the other side of said axis each including an extension that extends toward said bight portion adjacent its said aperture,

said spring being formed to spring bias said extensions toward each other to clampingly receive the tube therebetween when the tube is disposed in the passage,

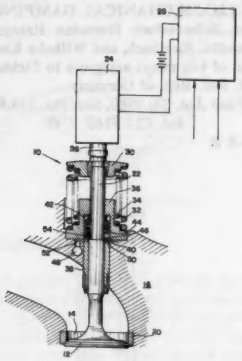
said spring extensions being disposed to respectively compressively engage opposed side portions of the tube, when the tube is received in the passage, which side portions are to either side of the tube first mentioned side portion, circumferentially of the tube, for biasing the tube within said chamber such that the tube first mentioned side portion follows said clamping member to return the tube to open position when said clamping member is rotated to reduce constriction thereof.

4,312,494

VALVE DEVICE USING AN ON-OFF FUNCTIONING TYPE ELECTROMAGNETIC ACTUATOR

Shunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 20, 1980, Ser. No. 161,376
Claims priority, application Japan, Jul. 3, 1979, 54-90808[U]
Int. Cl.³ F16K 31/02; F01L 1/16, 9/04
U.S. Cl. 251—48 2 Claims



1. A valve device comprising:

a valve seat fixedly disposed in a port section of a fluid passage;

a movable valve having a valve steam and which is seated on the valve seat to close the port section;

an electromagnetically operated actuator for moving said valve to leave the valve seat thereby opening the port section;

a return spring arranged to bias said valve to take the valve seat; and

damping means for slowing up the movement of said valve towards the valve seat in opposition to the force of the return spring just before seating of said valve on the valve set so that said valve is gently seated on the valve seat,

said damping means comprising:

means for defining a chamber;

a piston for braking the movement of said valve towards the valve seat just before seating of said valve thereon, said piston having a hole for passing a hydraulic fluid into said chamber and the hydraulic fluid out of said chamber, said hole having a relatively small diameter such that said hole limits the flow of hydraulic fluid passing therethrough, said piston being movable in opposite directions such that said piston increases the volume of said chamber to admit the hydraulic fluid into said chamber through said hole when said valve is moved away from the valve seat and that said piston decreases the volume of said chamber to compress the hydraulic fluid therein when said valve is moved towards the valve seat;

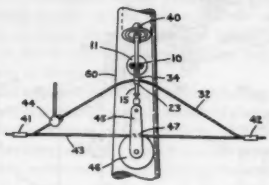
said valve stem being constructed and arranged such that just before seating of said valve on the valve seat, said valve stem abuts against said piston so as to bias the same to decrease the volume of said chamber and the movement of said valve towards the valve seat is braked and slowed up by said piston compressing the hydraulic fluid in said chamber due to the action of said valve and forcing out the hydraulic fluid from said chamber through said hole at a limited flow rate.

4,312,495

ELECTRICAL TRANSMISSION SYSTEM CONDUCTOR INSTALLATION TECHNIQUE

David R. Dunbar, Wilmington, N.C., assignor to Interpace Corporation, Parsippany, N.J.

Filed Apr. 10, 1980, Ser. No. 139,048
Int. Cl.³ B65H 59/00
U.S. Cl. 254—134.3 PA 3 Claims



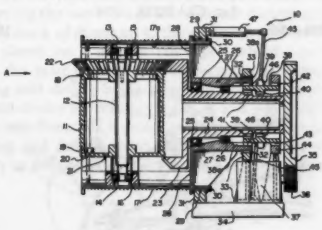
1. A method for attaching a line conductor to an electrical power transmission pole insulator comprising the steps of attaching a sheave to a connector extending from the insulator, supporting the line conductor on the sheave, attaching a cable to the line conductor at both sides of the sheave, attaching the cable to said connector, transferring the loading on the line conductor to the cable, attaching a suspension clamp to the cable, coupling the suspension clamp and line conductor to the connector, and removing the cable from the line conductor and the connector.

4,312,496

COMPACT CROSS SHAFT TYPE COMPOUND DRUM HOIST FOR SPOOLING EXTRA LONG LENGTHS OF TOW CABLE WITH SEGMENTED FAIRINGS

Robert S. Norminton, Niagara Falls, Canada, assignor to Fleet Industries, Ontario, Canada

Filed Jun. 26, 1980, Ser. No. 163,310
Claims priority, application Canada, Aug. 2, 1979, 333065
Int. Cl.³ B66D 1/26
U.S. Cl. 254—302 20 Claims



1. A compound drum hoist comprising:

(a) a first outer cable-spooling drum rotatably and drivingly mounted on a first shaft;

(b) a second inner cable-spooling drum nested within said first drum, and rotatably and drivingly mounted on a second shaft disposed at an angle of 90°±30° to said first shaft;

(c) means for rotating said inner drum while keeping said outer drum stationary, thereby to spool faired cable onto said inner drum;

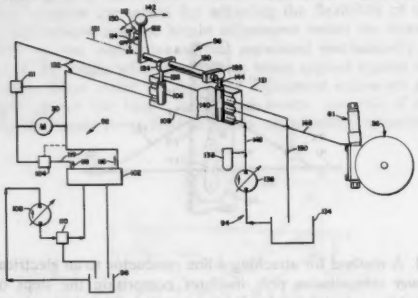
and (d) means for substantially simultaneously rotating said outer drum along with said inner drum, thereby to spool faired cable onto said outer drum.

4,312,497

HYDRAULIC WINCHES

Haskell M. Whaley, Chula Vista, Calif., assignor to Morris Whaley, Inc., Chula Vista, Calif.

Filed Oct. 12, 1979, Ser. No. 84,060
Int. Cl.³ B66D 1/22
U.S. Cl. 254—344 **16 Claims**



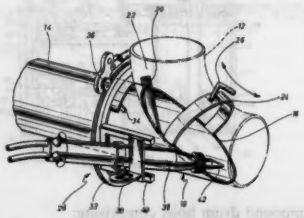
1. A hydraulic winch comprising: a rotatably mounted cable drum; a hydraulic motor for rotating said drum; means including a hydraulically operated, biased engaged clutch drive-connecting said motor to said cable drum; means for effecting a flow of operating fluid to said motor and to said clutch including first and second flow control valves for respectively controlling the flow of fluid to said motor and to said clutch; and an operator actuatable controller which is continuously displacable from a neutral position toward a first limit position for so controlling the operation of the second flow control valve of said flow effecting means that, as the controller is displaced from said neutral position toward said first limit position, the flow of fluid to said clutch is increased and an increasing, clutch disengaging, hydraulic force is exerted on said clutch, thereby allowing a load to be lowered at an operator selected rate independently of the speed or direction of rotation of said motor.

4,312,498

FIXTURE FOR CUTTING TUBE TURNS

Wayland B. Whiteside, Rte. 1, Box 206, Center, Tex. 75935

Filed Dec. 31, 1979, Ser. No. 108,407
Int. Cl.³ B23K 7/04
U.S. Cl. 266—56 **18 Claims**



1. A fixture for selectively positioning a tube turn having a curved outer surface and defining an arcuate center-line and a point of curvature, said fixture positioning said tube turn for cutting of said tube turn to a desired included angle, said fixture comprising:

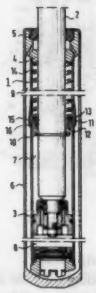
a support structure defining generally elliptical tube orienting surface means adapted to establish generally eliptical surface contact with the outer curved surface portion of said tube turn, said tube orienting surface being defined by intersection of an imaginary cylinder with the curved outer surface of a tube turn oriented with the center-line of said cylinder in intersecting relation with the arcuate center-line of said tube turn, said tube orienting surface having substantially continuous pheripheral surface contact with said outer curved surface portion of said tube turn.

4,312,499

SHOCK ABSORBER ASSEMBLY WITH OPERATIONALLY CONTROLLED HYDRAULIC-MECHANICAL DAMPING SYSTEM

Felix Wössner, Schweinfurt; Hermann Itzinger, Dittelbrunn; Günther Handke, Euerbach, and Wilhelm Koch, Bongard, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 114,845
Int. Cl.³ F16F 9/48
U.S. Cl. 267—8 R **14 Claims**



1. A shock absorber assembly comprising:

cylinder means;

piston means including piston rod means axially movably arranged within said cylinder means and having damping means for damping movement of said piston means relative to said cylinder means;

guide and seal means for said piston rod means arranged at one end of said cylinder means;

said cylinder means and said piston rod means being arranged to define an annular space therebetween; and

a hydraulic-mechanical damping system arranged in said annular space between said cylinder means and said piston rod means defining a damping flow path adapted to have the cross-sectional flow area thereof varied for providing variable damping characteristics in response to the degree of relative axial movement between said piston means and said cylinder means;

said hydraulic-mechanical damping system comprising spring means, an annular member arranged to be axially movable relative to said piston rod means in response to the action of said spring means and damping component means arranged to cooperate with said annular member to effect variation of the cross-sectional flow area of said damping flow path in response to relative movement between said piston rod means and said cylinder means, said annular member and said damping component means being configured for cooperation with each other and with said spring means such that said cross-sectional flow area of said damping flow path is continuously incrementally reduced when said piston rod means is moved to a predetermined degree outwardly of said cylinder means and substantially abruptly increased upon reverse movement of said piston rod means inwardly of said cylinder means.

4,312,500

PATIENT SUPPORT

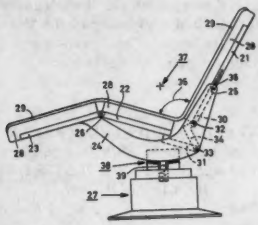
Jozef T. A. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,079

Claims priority, application Netherlands, Feb. 28, 1979, 7901576

Int. Cl.³ A61B *13/00*

U.S. Cl. 269—324 4 Claims



1. A patient support comprising:

a frame;

first and second parallel shafts mounted on the frame;

first and second supporting elements each having first and second ends, said first supporting element pivotably connected to said first shaft and said second supporting element pivotably connected to said second shaft such that the second end of one supporting element is adjacent the second end of the other supporting element in at least one position of the patient support, the pivotable connections being at distances away from the second ends; and

a single coupling rod having two ends, each end pivotably connected to one of the second ends of the supporting elements.

4,312,501

APPARATUS FOR PATTERN-ALIGNED STACKING OF FABRIC WEB SECTIONS

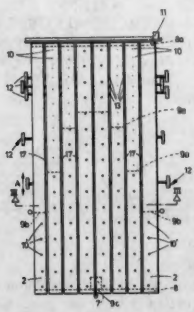
Gustav G. Veith, Frasdorf, Fed. Rep. of Germany, assignor to Gustav Georg Veith GmbH, Frasdorf, Fed. Rep. of Germany

Filed Jan. 18, 1980, Ser. No. 113,255

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903473

Int. Cl.³ B65H *29/46*

U.S. Cl. 270—30 8 Claims



1. A stacking table having a substantially flat top surface upon which fabric web sections can be stacked for simultaneous cutting, and having upright needles that can project above said surface for impalement of successive web sections at predetermined points in a pattern of the fabric, to enable stacking of the web sections in pattern-aligned relation to one another and establishment of cutting pattern elements in a predetermined relationship to the fabric pattern, said stacking table being characterized by:

A. frame;

B. a plurality of elongated strips supported by said frame in lengthwise parallel substantially coplanar relationship to one another and cooperating to define said top surface, said strips being laterally spaced apart to define elongated slots between them;

C. a plurality of elongated needle supporting elements;

D. cooperating means on the frame and on each needle supporting element for mounting the needle supporting element on the frame beneath said strips and extending transversely to them;

E. each of said needle supporting elements having a plurality of upwardly projecting needles mounted thereon at locations vertically aligned with said slots;

F. said cooperating means for each needle supporting element further comprising means guiding the needle support element for motion lengthwise of the strips to enable simultaneous adjustment of the plurality of needles on said element as to their position lengthwise along the respective slots; and

G. means for holding said needles, so that each such needle can project up through one of said slots.

4,312,502

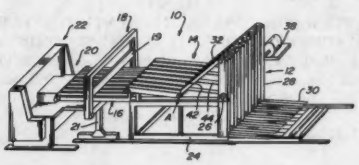
SHEET STACK INVERTING APPARATUS

Donald R. Wilt, Medford, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Apr. 25, 1980, Ser. No. 143,973

Int. Cl.³ B65H *1/22*

U.S. Cl. 271—3.1 10 Claims



1. Apparatus for lifting and turning a stack of sheets comprising a first conveyor having an inlet end for receiving sheets and conveying the same in a predetermined direction, a device for lifting a stack of sheets up to the elevation of and for depositing the sheets on a second conveyor which conveys the sheets to the inlet of said first conveyor, the improvement comprising said device being generally Z-shaped, means supporting said device for rotation about an axis generally perpendicular to said direction, a motor means coupled to said device for rotating said device about said axis so that two stacks of sheets may be delivered to said conveyor per revolution of said device.

4,312,503

SPRING-LOADED FRICTION RETARD SEPARATOR

Allan L. Saxinger, Denton; Clayton M. Haigh, and Barry C. Kockler, both of Lewisville, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1980, Ser. No. 153,281

Int. Cl.³ B65H *3/04, 3/52*

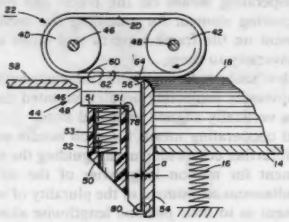
U.S. Cl. 271—34 4 Claims

1. An apparatus for feeding and separating individual sheets from a stack of sheets comprising:

a compressible endless sheet feeding and separating belt mounted for rotational movement about spaced supports and positioned for sheet feeding engagement with said stack of sheets;

a retard member having a finitely curved frictional retard surface;

mounting and guiding means to support said retard member in a predetermined location such that said retard surface is capable of engaging said belt in a section where said belt material will be compressed upon said engagment thereby limiting belt deflection by said engagement, said mounting and guiding means being capable of allowing movement of said retard member toward or away from said belt during rotational movement of said belt and said feeding of said sheets;



biasing means adapted to bias said retard member into engagement with said belt;

said mounting means being adapted to allow said retard member to rotate about a moment point generally adjacent the upstream end of said retard member and lock in a predetermined position during roatational movement of said belt and said feeding of said sheets, the force generated by said lock and said biasing means being sufficient to provide sheet separation.

4,312,504

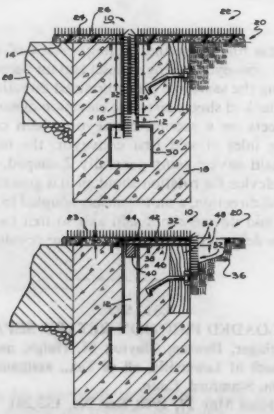
SYSTEM FOR CONVERTING SYNTHETIC TURF SURFACES FROM ONE TO ANOTHER CONDITION

Loren R. Rutledge, St. Louis, and James B. Siegle, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,188

Int. Cl.[3] A63J *3/00*

U.S. Cl. 272—3 **3 Claims**



1. In an area containing synthetic turf which is convertible from one surface condition which includes synthetic turf on such area to another surface condition which includes an exposed portion of such area having no synthetic turf, wherein said one surface condition includes two sections of synthetic turf having marginal portions held in wedged engagement in a receiving slot located below ground level with the remainder of the sections coextensively covering such area, which conversion requires (1) the removal of both marginal portions and one of the sections to provide said exposed portion of the area of said another surface condition, and (2) the subsequent repositioning of a section and anchoring of its marginal portion with the marginal portion of the unremoved section of synthetic turf to provide said one condition; the improvement which comprises an L-shaped support means for cooperation with said slot when said marginal portions are removed in providing said another condition, one leg of said L-shaped support means projecting snugly within said slot with the remaining leg extending toward the portion of such area having no synthetic turf and supporting the margin of the remaining synthetic turf section previously in the slot substantially coextensive with the rest of such remaining turf section, thereby providing a penetration-resistant cover.

4,312,505

INVALID'S WHEELED WALKER

Raymond E. Engelhart, Rte. 4, Park Rapids, Minn. 56470

Filed Apr. 1, 1980, Ser. No. 136,276

Int. Cl.[3] A61H *3/00*

U.S. Cl. 272—70.3 **6 Claims**

1. A wheeled walker for invalids comprising, in combination, a tubular three sided frame open at the rear; upstanding inverted U-shaped side bars mounted on said frame; cross bars rigidly connecting the front and tops of said side bars; a pair of vertically disposed, spaced sockets mounted on each of said side bars; a leaning rest for the forearms having mating depending tubular supports mounted in said sockets; a hand hold bar fixed to and projecting forwardly of said leaning rest; waist encircling belt means fixed to and substantially centrally of said leaning rest; a tubular bracket fixed to the top rear of each said side bar; a third inverted U-shaped bar insertable in said brackets; and a second belt fixed to said third bar to encircle and support the rear of said first belt when encircling an invalid.

4,312,506

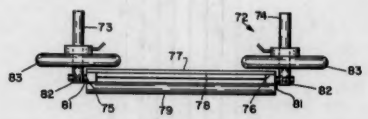
BICEP EXERCISING CURLING BAR

William F. Brennan, 6 Mt. Paul Rd., Tyngsboro, Mass. 01879

Filed Nov. 5, 1979, Ser. No. 91,352

Int. Cl.[3] A63B *11/00*

U.S. Cl. 272—123 **10 Claims**



1. An exercise device of the barbell and dumbell type especially for use in curling exercises to develop and strengthen the bicep brachii, said device comprising:

an elongated, generally rectangular, weight distributing, plate of rigid material having a pair of opposite longer sides and a pair of opposite shorter ends said plate being padded and being dimensioned to span the heel of the hand, the wrist and the lower forearm;

a pair of elongated weight-supporting end rods each mounted to extend from one of the opposite shorter ends

of said plate in a common plane and in rectilinear alignment with a space therebetween;

a weight on each of said elongated weight-supporting end rods; and

a hand grip rod means mounted to extend in parallelism with one of the longer sides of said plate, at a spaced distance therefrom, to create a finger insertion aperture, said hand grip rod means being in a plane laterally offset from, but parallel to, the common plane of said weight supporting end rods;

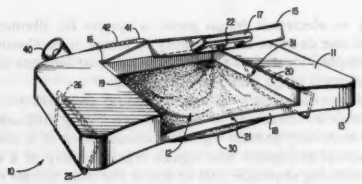
whereby when said hand grip rod means is grasped in palms-up, supine, hand position and the device is curled, the center of gravity is moved back behind the hand grip rod means to the padded plate to span the heel of the hand, wrist and lower forearm.

4,312,507

PORTABLE LIGHTED STUDY OR GAME TRAY

Billy E. Smith, and Carol H. Smith, both of 821 N. Tenth St., Opelika, Ala. 36801

Filed Oct. 3, 1980, Ser. No. 193,450
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—237 **4 Claims**



1. A portable lighted study or game tray, comprising: a planar base member of generally rectangular shape for use by a person positioned adjacent one of the long sides of the rectangle; the two corners of said base member adjacent said long side of the rectangle adjacent the user being rounded and extending beyond said rectangle in the direction of the user; an opening in the base member, said opening being generally square-shaped and extending from the side of the base member adjacent the user to a position in the center portion of said base member; a downwardly extending accessory bag attached around the interior sides of the base member adjacent said opening; a cover lid hingedly attached to the base member along the side of the opening opposite said user, said cover lid having game indicia on the upper surface thereof and being generally flat and coplanar with the base member in the horizontal or closed position of said cover lid; a pair of folding legs attached to the underside of said base member and extending generally parallel to the short sides of said rectangular base member, said legs including means for folding said legs flat against the underside of said base member; a flexible arm attached to the base member adjacent the side opposite the user, said flexible arm having means for detachably receiving a light source at the end portion thereof; and a light source positioned in said end portion of the flexible arm.

4,312,508

DICE GAME AND TEACHING AID

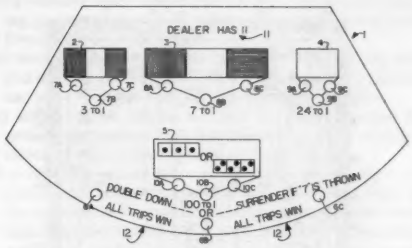
Michael W. Wood, 1106 Willow Brook Ave., Denham Springs, La. 70726

Filed Aug. 4, 1980, Ser. No. 175,065
Int. Cl.³ A63F *5/04*
U.S. Cl. 273—274 **3 Claims**

1. A dice game for players utilizing three, tri-colored dice or their mechanical equivalent, which are coded so that their sides with numerals 1 and 2 are one color, their sides with numerals 3 and 4 are a second color, and their sides with numeral 5 and 6 are a third color, which comprises:

(a) setting rewards on certain color and number combinations that can exist when said dice are rolled, wherein one of said number combinations is the total of the numerals coming up when said dice are rolled is greater than eleven, referred to as a basic combination;

(b) said players indicating which of said combinations will exist on the next roll of said dice and how much risk each of said players will take on each of said combinations,



wherein said players being required to indicate a risk on said basic combination;

(c) rolling said dice;

(d) rewarding said players in an amount determined by said rewards and said risk; and

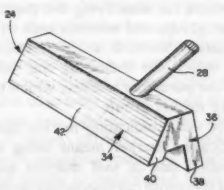
(e) wherein if said total is seven, a fourth dice is rolled and wherein if the new four dice total is greater than eleven, rewarding said players in said amount.

4,312,509

GOLF PUTTER

R. M. Grant, 179A Haywardville Rd., East Haddam, Conn. 06423

Filed Apr. 29, 1980, Ser. No. 144,931
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—167 A **9 Claims**



1. A golf putter comprising:

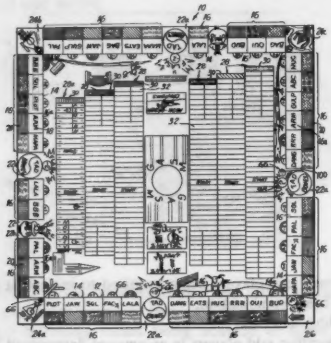
a shaft having upper and lower ends and a longitudinal axis;

a ball striking head mounted to said lower end of said shaft being generally defined by a forward member for striking a ball lying on the ground and a rear member opposite said forward member, said rear member terminating at a rear base which extends transverse of the longitudinal axis of said shaft, said foward member terminating at a forward base which extends transverse of the longitudinal axis of said shaft, said forward base and said rear base defining between them a channel which extends transverse of the longitudinal axis of said shaft and generally parallel to said forward base and said rear base, an extremity of said forward base being nearer to said upper end of said shaft than an extremity of said rear base such that when said shaft is in an upright position and said rear base engages the ground, gravity tends to cause said shaft to rotate forwardly and downwardly about said rear base with said forward base tending to move toward engagement with the ground.

4,312,510
BOARD GAME APPARATUS

Richard Bodner, Box 199, Montezuma Rte., Las Vegas, N. Mex. 87701

Filed Dec. 11, 1979, Ser. No. 102,979
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—256 14 Claims



1. Board game apparatus comprising:

a first playing area on a game board having a continuous track defined by a plurality of spaces, each of a majority of said spaces constituting a market representing a plurality of ownership shares, at least two of said markets belonging to one of a plurality of market groups and each market having first indicia associated therewith for identifying a particular market and second indicia for identifying the particular market group to which said particular market belongs;

a set of value scales, each of said value scales being associated with a corresponding one of said market groups and having indicia associated therewith corresponding to said second indicia for identifying the particular corresponding market group, and wherein each of said value scales has associated therewith at discrete locations thereon a series of indicia for indicating the value of ownership shares of the particular markets which belong to the corresponding market group;

a plurality of value indicating marker means, each of said value indicating marker means being associated with a corresponding one of said markets and having indicia associated therewith corresponding to said first indicia for identifying the particular corresponding market, each respective value indicating marker means being moveably located on a respective value scale relative to the value indicating indicia thereon, which value scale corresponds to the market group to which the market associated with the respective value indicating marker means belongs, to indicate a particular value for shares of the corresponding market;

value altering means for directing the movement on the respective value scales on which they are located relative to the value indicating indicia thereon of one of the value indicating marker means, of all of the value indicating marking means belonging to a particular market group, and of all of the value indicating marker means, to thereby alter the values of the shares of markets corresponding thereto;

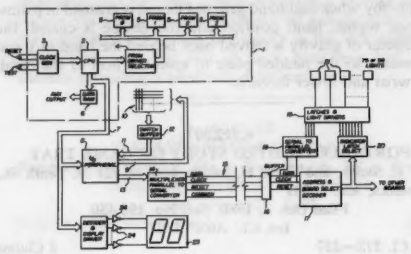
at least one player token for movement on the spaces around said track whereby players purchase, sell and otherwise trade shares in said markets as the tokens move around said track; and

token movement control means.

4,312,511
ELECTRONIC BINGO SYSTEM

Graham A. Jullien, Windsor, Canada, assignor to James J. Ogilvy, Ontario, Canada

Filed Mar. 8, 1979, Ser. No. 18,504
Claims priority, application Canada, Apr. 7, 1978, 300670
Int. Cl.[3] A63F *3/06*
U.S. Cl. 273—237 22 Claims



1. In an electronic bingo game, a system for illuminating selected one or more of a plurality of lamps in an illuminated bingo display located at a remote location to indicate one or more selected bingo numbers comprising:

(a) a microcomputer system, including data and program memories connected to a central processing unit, adapted to store and process signals representative of a selected external crosspoint and signals representative of a signal processing sequence, and to derive the store signals representative of one or more of said lamps to be illuminated, as a result of translation of the processing sequence signals,

(b) means connected to and controlled by the microcomputer system for scanning an array of external crosspoints and for translating the closing of said selected crosspoint to a location signal representative of the location of said crosspoint in said array, and including storing means for storing the location signal,

(c) converter means connected to the storing means for translating the location signal into a serial bit stream signal representative of the address of one or more particular lamps to be illuminated, and

(d) a display bus connected to the output of the converter means for carrying the serial bit stream signal, for connection to a serial bit stream signal decoding and lamp illumination circuit.

4,312,512
CYLINDER HEAD GASKET FOR INTERNAL COMBUSTION ENGINES

Jean-Francois Conte, 22 bis rue Alberic Pont, Lyon 5°, Rhone, and Henri Carles, Les Paris, Loisieux, Savoie, both of France

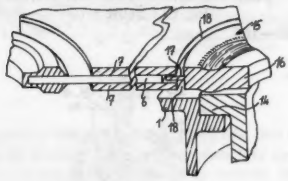
Filed Jan. 18, 1980, Ser. No. 113,322
Claims priority, application France, Jan. 18, 1979, 79 01855
Int. Cl.[3] F16J *15/08*
U.S. Cl. 277—235 B 11 Claims

1. A cylinder head gasket for sealing between the upper flat surface of an engine block and the lower flat surface of a cylinder head, the upper flat surface of the engine block having at least one cylinder lining and portions defining at least one first fluid passage, the lower flat surface of the cylinder head having portions defining at least one second fluid passage centrally located with said at least one first fluid passage of said engine block, said head gasket comprising:

two external flat metal foils, each of said two external flat metal foils having a top surface and an opposite surface, said top surface of one of said two external flat metal foils mounted adjacent to the lower flat surface of the cylinder head, said opposite surface of another of said two external flat metal foils mounted adjacent to the upper flat surface

of the engine block, each of said two external flat metal foils further having at least one first aperture centrally located with said at least one first and second fluid passages;

a central flat metal foil having a top portion attached to said opposite surface of one of said two external flat metal foils and a bottom portion attached to said top surface of another of said two external flat metal foils, said two external foils and said central foil further being integrally connected to form an integral flat body member, said central flat metal foil further having at least one second aperture centrally located with respect to said at least one first aperture of each of said two external flat metal foils to permit flow communication between said at least one first



fluid passage and said at least one second fluid passage, said at least one first aperture of each of said two external flat metal foils further being larger than said at least one second aperture forming a first flat zone on said top portion of said central flat metal foil between said at least one first aperture and said at least one second aperture and a second flat zone on said bottom portion of said central flat metal foil between said at least one first aperture and said at least one second aperture; and

means attached to said central flat metal foil around the periphery of said at least one second aperture for sealing said at least one first and said at least one second fluid passages so as to prevent the loss of fluid between said at least one first passage in said cylinder block and said at least one second passage in said cylinder head.

4,312,513

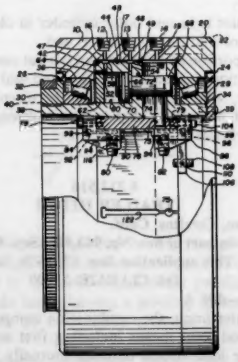
GEAR HOLDING HYDRAULICALLY ACTUATED CHUCK

Henry F. Swenson, Roseland, N.J., assignor to J & S Tool Company, Livingston, N.J.

Filed Aug. 10, 1979, Ser. No. 65,640

Int. Cl.³ B23B *31/20*

U.S. Cl. 279—1 G **22 Claims**



1. A hydraulically actuated holding chuck for gears having their teeth profiles finished or substantially finished, this chuck disposed to grip like-formed and finished gears by and on the teeth profile while the bore of the held gear is finished, said chuck including:

(a) a fixed outer housing having a plurality of hydraulic conductors leading from the exterior of the housing to an interior bore in said housing;

(b) a fixed end member removably secured to said fixed outer housing;

(c) a rotatable body carried interior of the fixed outer housing, an interior portion of this body having a conical bore formed therein and thereon;

(d) bearing means disposed between the outer housing and end member and rotatable body and adapted to rotatably carry the rotatable body in a determined orientation;

(e) sealing means carried adjacent the bearing means to protect the bearings from the unwanted exterior contamination of the bearings by dirt, dust and/or chips;

(f) a collet carried by the rotatable body and having a tapered outer surface compatible with the conical bore in the rotatable body, said collet being axially movable with respect to the rotatable body, axial movement of the collet within the conical bore of the body producing an in and out movement of the collet corresponding to the axial movement of the tapered outer surface of the collet in the conical bore of the rotatable body;

(g) a plurality of segments arranged as pairs and carried by the collet;

(h) means for securing in a selected position said segments as pairs to the opposite ends of the collet wherein said means for securing the segments in a selected position are a plurality of tapped holes arranged as accurate groups in each end of the collet;

(i) a pin carried in each segment and selectively movable in response to the in and out movement of the collet;

(j) means for adjustably positioning each pin in its segment holder to precisely bring the pin to a desired gripping position in the tooth of a gear when the collet is at its inner limit;

(k) means for rotating the rotatable body and associated components and the gripped gear for machine finishing the bore of the gear;

(l) adjustable stop means for engaging the gear at a stop shoulder so that the position of a gear in the chuck is the same with each gripped gear wherein said adjustable stop means for engaging the gear is an arm carried by the collet and fastened in one of said tapped holes and having a threaded portion adjustably moved in said arm to bring an end of said screw into a determined stop condition, and

(m) a plurality of pistons carried in the rotating body and disposed to move engaging means by which the tapered collet is moved axially to eastablished limits to cause the collet to be drawn inwardly and outwardly in response to the movement of the pistons, said pistons being moved by hydraulic fluid fed through said conduits in the outer housing.

16. A method for holding gears with and by a fixture with the gears having their teeth profiles finished or substantially finished, this method including gripping like-formed and finished gears by and on their teeth profiles while the bore of this held gear is finished, said method of forming said fixture including:

(a) providing a fixed outer housing and forming a plurality of hydraulic conductors leading from the exterior of the housing to an interior bore formed in said housing;

(b) rotatably mounting a body carried interior of the fixed outer housing and forming the interior portion of this body with a conical bore in axial alignment with the bore of the housing;

(c) carrying said body in and by bearing means disposed between the fixed outer housing and the rotatable body, said bearing means adapted to carry the rotatable body in a selected and determined orientation;

(d) sealing the bearing means to protect the bearing means

from unwanted exterior contamination such as dirt, dust and the like;

(e) carrying a collet in and by the rotatable body and forming said collet with a tapered outer surface compatible with the conical bore formed in the rotatable body, said axial movement of the collet within the conical bore of the body producing an in and out movement of the collet corresponding to the axial movement of the tapered outer surface of the collet in the conical bore of the rotatable body;

(f) providing in each end said collet with a plurality of tapped holes arranged in arcuate groups and arranging and mounting a plurality of segments as pairs and securing in a selected position said segments as pairs, each segment secured to an opposite end of the collet in selected tapped holes and carrying a tooth engaging pin in each segment so as to be selectively movable with the in and out movement of the collet;

(g) adjustably positioning each engaging pin in the segment holder to precisely bring the engaging pin to a desired gripping position in the tooth of a gear when and while the collet is moved and brough to its inner limit;

(h) rotating the rotatable body and associated components and the gripped gear so as to permit the machine finishing of the bore of the gear;

(i) providing an adjustable stop means comprising an arm having a threaded portion adjustably movable in said arm and arranging and positioning said adjustable stop which is secured to and carried at one end of the collet in a selected tapped hole so as to engage a gear at a selected shoulder so the gripped gear is positioned in the chuck at the same selected location, and

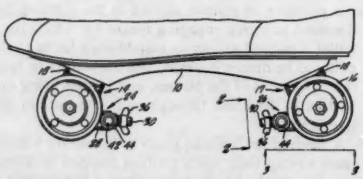
(j) carrying a plurality of pistons in the rotating body and moving said pistons by hydraulic means so as to move the collet axially to cause inward and outward movement of the gripping pins to established limits of movement, this hydraulic fluid being fed through the conductors in the housing.

4,312,514

ROLLER SKATE BRAKE

Isadore Horowitz, P.O. Box 5874, Bossier City, La. 71010, and Reuben B. Klamer, 969 Hilgard, Los Angeles, Calif. 90024

Filed Jan. 7, 1980, Ser. No. 110,207
Int. Cl.³ A63C *17/14*
U.S. Cl. 280—11.2 **1 Claim**



1. A roller skate comprising:

(a) a base plate;

(b) wheel journals pivotally attached to said base plate;

(c) at least one front roller skate wheel journaled to one said wheel journal;

(d) at least one rear roller skate wheel journaled to one said wheel journal;

(e) an adjustable brake assembly having;

(1) a channel member fixedly attached to at least one said wheel journal;

(2) a threaded member fixedly attached to said channel member and extending perpendicularly above said channel member;

(3) a brake member adapted to slidably fit on said threaded member within said channel member and having brake drums rotatably attached to its ends which are positioned above said roller skate wheels;

(4) a spring placed upon said threaded members and against said brake member; and

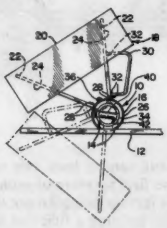
(5) a threaded nut to engage said threaded member thereby retaining said brake member within said channel assembly and providing the means to adjust the position of said brake member relative to said roller skate wheel.

4,312,515

SELF-LOCKING STEP ASSEMBLY FOR A VEHICLE

Raymond J. Allori, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,432
Int. Cl.³ B60R *3/02*
U.S. Cl. 280—166 **3 Claims**



1. A self-locking step assembly for a vehicle having a frame, said assembly including an outer cylinder rigidly secured substantially vertically to said frame, an inner cylinder slidably and rotatably positioned within said outer cylinder, a step secured to the bottom section of said inner cylinder substantially perpendicular to said inner cylinder, a locking pin secured to one of said inner and outer cylinders, and a cam slot in the other of said inner and outer cylinders engaging said pin in a first portion to establish the used position of said step, and in a second portion to establish the stored position of said step and in a third portion connecting said first and second portions establishing the transition position of said step, said step being restrained in said used and stored positions by gravity and being manually movable between said used and said stored position wherein;

said pin is secured to said inner cylinder in close proximity to the top of said inner cylinder;

said step is detachably and rigidly secured to said inner cylinder;

said cam slot is in said outer cylinder in close proximity to the top of said outer cylinder; and

said third portion of said cam slot is a cut out connecting said first portion, said second portion and said top of said outer cylinder, whereby said pin can be disengaged from said cam slot when said step has been disengaged from said inner cylinder.

4,312,516

TRAILER HITCH

Gary E. Olsen, Cerritos, Calif.

Continuation-in-part of Ser. No. 943,448, Sep. 18, 1978, Pat. No. 4,198,073. This application Sep. 17, 1979, Ser. No. 76,066
Int. Cl.³ B62D *53/00*
U.S. Cl. 280—406 A **14 Claims**

1. In a trailer hitch, the combination comprising

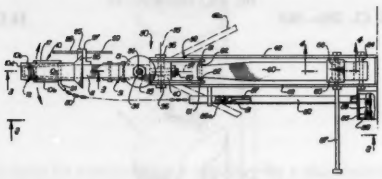
(a) universal joint means including first and second members, the joint means defining mutually orthogonal axes about which said members are relatively rotatable, said axes including a generally vertical axis associated with the first member, and a generally lateral axis associated with

the second member, there being a lever pivotally connected to said members to pivot the first member up and down about the lateral axis,

(b) first frame structure connected to the first member and attachable to a towing vehicle, and second frame structure connected to the second member and attachable to a towed vehicle, and

(c) weight adjustment means on the second frame structure operatively connected to the first frame structure substantially entirely through said lever and said first member to adjustably displace the first frame structure up and down by force transmission substantially entirely through the lever and said first member,

(d) said adjustment means including another part and a compression spring operatively connected between said part and the lever, said part being adjustably shiftable to effect said rocking of the lever by motion transmission through the spring, said lateral axis being at the spring side of said vertical axis.

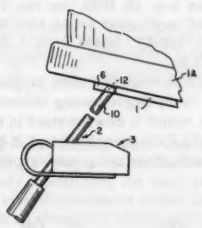


4,312,517

RELEASABLE SKI BINDING WITH SKI BRAKE LOCATING STOP

Richard G. Spademan, Box 6410, Incline Village, Nev. 89450

Filed Feb. 14, 1980, Ser. No. 121,366
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **10 Claims**



1. In a releasable ski binding having clamping means for releasably securing a ski boot to a ski, said ski boot having plate means mounted to the boot substantially parallel to the sole thereof, and a ski brake having a holding means for holding said ski brake in an inoperative position, the improvement comprising:

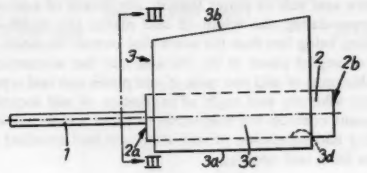
means for centering said ski boot laterally and longitudinally relative to said clamping means, said centering means comprising said holding means and plate means adapted for mutual engagement.

4,312,518

BRAKING BLADE AND MOUNTING THEREFOR

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Oct. 15, 1979, Ser. No. 85,174
Claims priority, application Austria, Oct. 25, 1978, 7671/78
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **9 Claims**



1. A blade for a ski brake pivotally mounted on a ski, comprising:

an elongated brake arm having an enlarged and elongated mandrel on a terminal end thereof, said mandrel having an external first surface thereon;

an elongated brake blade having means defining a hole therethrough and extending in the longitudinal direction and along one lateral side thereof, said hole having an interior second surface matching said first surface on said mandrel and being adapted to receive said enlarged and elongated mandrel therein, the length of said brake blade being shorter than the length of said mandrel, said brake blade having a large exterior third surface extending laterally from said one side and facing in a direction generally perpendicular to the longitudinal axis of said arm; and

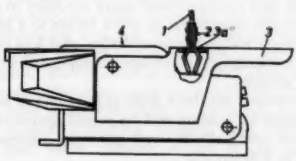
connecting means for releasably connecting said brake blade to said enlarged and elongated mandrel so that said first and second surfaces are operatively engaged with each other, said mandrel extending outwardly beyond both ends of said hole in said brake blade.

4,312,519

SAFETY-STRAPLIKE CONNECTING MEMBER

Josef Svoboda, Schwechat, and Heinz Wittmann, Vienna, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Apr. 19, 1979, Ser. No. 31,493
Claims priority, application Austria, Apr. 21, 1978, 2897/78
Int. Cl.³ A63C 9/00
U.S. Cl. 280—637 **3 Claims**



1. A safety strap securable between the leg of a skier and means affixed to a ski, comprising: a pair of separate, elongated, angled, elastically deformable plates and securing means for securing one end of said plates to said strap, said plates being identical but oriented to form a mirror image of each other symmetrical about a reference plane therebetween, each of said angled plates including at least a pair of plate segments angularly related to each other to define an obtuse angle therebetween, separating means cooperable with said angled plates at said one end thereof for spacing said angled plates from each other so that the mutually adjacent ends of a first pair of said

plate segments located at the ends of said plates opposite said one ends thereof and on opposite sides of said plane of symmetry are spaced from each other and inclined with respect to said plane of symmetry, a second pair of said plate segments located on opposite sides of said plane of symmetry and adjacent said strap being inclined to said plane of symmetry at a steeper angle than the angle of inclination of said first pair of plate segments, said means affixed to said ski including means defining a rectangular opening therein adapted to releasably receive said pair of plates therein, the length of said opening accommodating the width of said plates, the width of said opening being less than the assembled overall thickness of said pair of angled plates at the thickest part but accommodating the thickness of said one ends of said plates and said separating means, whereby said angle of inclination of said second plate segments controls the magnitude of force which will effect a pulling and separation of said strap and said attached angled plates from said opening.

4,312,520
SEMI-TRAILERS

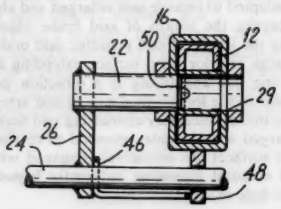
Keith Burman, Wellingborough, England, assignor to York Truck Equipment Limited, Northamptonshire, England

Filed Jan. 24, 1980, Ser. No. 115,079

Claims priority, application United Kingdom, Jan. 26, 1979, 02879/79

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—765 **6 Claims**



1. Apparatus for supporting the front end of a semi-trailer, said apparatus comprising

two ground engaging landing legs mounted to the chassis of the trailer, each leg being connected to the other for part rotational movement on a common shaft extending across the width of the trailer,

a compressed air power cylinder connected to said legs and operable to raise the feet of said legs between a ground engaging operative position and a ground free inoperative position, said common shaft being mounted to the trailer and operably connected by crank means to a push rod of said compressed air power cylinder, said legs being lifted to said inoperative position upon compressed air being fed to said cylinder,

a strut extending angularly from at least one of said legs to said chassis for holding said leg in said operative position, said strut being slidably and pivotally mounted to said chassis in a mounting,

locking means engageable with said strut to hold said strut in said operative and inoperative positions, said locking means comprising a pin engageable with a first hole and a second hole in said strut, said pin being resiliently biased to engage in either said first or second hole by biasing means, an end portion of said pin being chamfered, said pin's chamfered portion extending into at least one of said holes in said latched out position, an edge of either hole engaging said pin's chamfered portion to force said pin against said biasing means fully out of said hole and to cause said locking means to be released, upon movement of said strut between said operative and inoperative leg positions, and

latch means to hold said pin at least partially out of either hole in a latched out position.

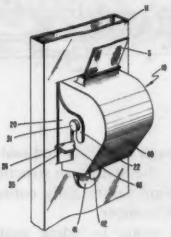
4,312,521
SAFETY BELT RETRACTOR ASSEMBLY UTILIZING VEHICLE STRUCTURE

Rudy V. Thomas, Sterling Heights; David A. Pickett, Warren, both of Mich., and Terry R. Harrell, Lima, Ohio, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 6, 1980, Ser. No. 127,666

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **14 Claims**



1. In the combination of a safety belt retractor assembly and a vehicle interior structural support member, the improvement comprising:

a rotatable retractor spool having a safety belt wound thereon, a support shaft extending through said spool to receive the load exerted on the belt due to occupant-induced forces, and locking means in said retractor assembly to lock said spool against rotation; and

a pair of integral raised flanges on said interior support member adjacent with the ends of said spool for directly mounting said support shaft, whereby the load caused by the restraining force of the belt is transmitted directly to said structural support member from said shaft.

4,312,522
HEAT SENSITIVE RECORDING SHEET

Akihiro Yamaguchi, Kamakura; Keizaburo Yamaguchi, Kawasaki, and Hisamichi Murakami, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

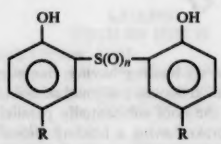
Filed Aug. 14, 1980, Ser. No. 177,999

Claims priority, application Japan, Oct. 24, 1979, 54/107084

Int. Cl.³ B41M *5/18, 5/22*

U.S. Cl. 282—27.5 **7 Claims**

1. A heat sensitive recording sheet prepared by coating on a sheet substrate, or by impregnating therein a coupler, developer and binder, which is characterized in that said developer is one or more of 2,2'-bisphenolsulfide, 2,2'-bisphenolsulfoxide-,and 2,2'-bisphenolsulfone compounds represented by the general formula (I)



(I)

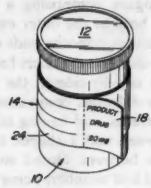
where R represents hydrogen, an alkyl radical of from 1 to 12 carbon atoms, a cycloalkyl radical of from 3 to 10 carbon atoms, an aralkyl radical of from 7 to 10 carbon atoms, and a phenyl radical, and may be identical to or different from each other, n is zero, or an integer of 1 or 2.

4,312,523

LABEL FOR CONTAINER HAVING PHARMACEUTICAL PRODUCT THEREIN

Russell R. Haines, Cherry Hill, N.J., assignor to PACO Packaging Incorporated, Lakewood, N.J.

Filed Oct. 29, 1979, Ser. No. 89,645
Int. Cl.³ G09F 3/04
U.S. Cl. 283—18 **8 Claims**



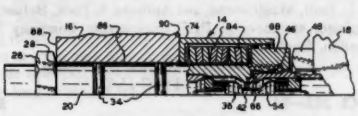
1. A label for attachment to a container for a pharmaceutical product comprising an elongated strip substantially longer than the circumference of the container to which it is adapted to be secured, said strip being delineated on one surface thereof into first and second end zones and a center zone there between, the end zones including indicia identifying a product by name and quantity or weight as well as expiration date beyond which the product should not be used, said first end zone being detachably connected to the adjacent center zone, said center zone being longer than the end zones and containing indicia with respect to the product to be inserted in the container, said first end zone containing adhesive on the opposite face thereof for permanently securing the first end zone to a container, and an adhesive stripe on the opposite face of said label adjacent the juncture of said second end zone and said center zone, said stripe being spaced from the free end of said second end zone to thereby leave a pull tab defined by the free end of said second zone, said stripe constituting a means for releaseably securing said second end zone to an intermediate portion of the label when the label is wound around a container.

4,312,524

SELF-ALIGNING COUPLING

Alan R. Allread, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 7, 1979, Ser. No. 101,097
Int. Cl.³ F16L 3/04
U.S. Cl. 285—161 **3 Claims**



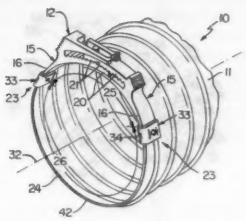
1. A self-aligning fluid coupling for mounting within a movable support member having a cylindrical bore and a radial shoulder transversely intersecting the bore wherein the coupling is capable of axial displacement within the bore comprising, in combination, an elongated tubular body having an axis, a cylindrical exterior surface of a diameter slightly less than that of the support membr bore, a conduit connection end, a coupling sealing end, and a thread defined upon said exterior surface adjacent said sealing end, an annular threaded collar threaded upon said threads, an annular cap slidably mounted upon said cap for axial movement thereon relative to said body, said cap including a shoulder disposed toward said body conduit connection end, compression spring means interposed between said collar and cap biasing said cap toward said body conduit connection end, abutment means mounted on said cap engaging said collar limiting axial movement of said cap on said collar under the influence of said spring means, said cap shoulder selectively engaging the support member shoulder whereby axial force may be imposed upon said cap and body by the support member through said spring means.

4,312,525

HOSE CLAMP STRUCTURE AND METHOD OF MAKING SAME

Donald L. Kleykamp, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed May 27, 1980, Ser. No. 153,981
Int. Cl.³ F16L 33/22
U.S. Cl. 285—236 **20 Claims**



1. In a hose clamp structure for a hose construction which has a hose end provided with a reinforcing wire wherein said structure comprises a pair of separate cooperating interconnectible members each having an inner portion provided with a fastening opening and an outer portion provided with a plurality of teeth adapted for interconnecting engagement, and means for fastening each of said members to said reinforcing wire in said hose end, said members upon being interconnected around said hose end extending substantially over a first arcuate length of said hose end with a second arcuate length of said hose end completing the remaining 360° C. circumference of said hose end, said members upon being fastened to said hose end and interconnected to each other employing said second arcuate length of said hose end as clamping means, said connected members and second arcuate length cooperating to define an annular construction enabling said hose end to be clamped around an associated conduit, the improvement wherein each fastening opening is an elongate opening and said fastening means for each of said members comprises a U-shaped clip having a bight and a pair of legs, each clip having a tool-receiving opening in one of its legs and holding means in the other of its legs for receiving a radial convolution defined in said reinforcing wire, said holding means in each clip being disposed in aligned relation with its tool-receiving opening, each clip being disposed with its bight against an end edge of said hose end and with its parallel legs embracing the inner portion of an associated interconnectible member and hose end with its reinforcing wire, and each clip having its tool-receiving opening and holding means disposed on opposite sides of and in aligned relation with an associated elongate fastening opening, each radial convolution having been defined by a tool disposing same radially through an associated tool-receiving opening, elongate fastening opening, and holding means whereby each radial convolution and its clip cooperate to fasten an associated member on the hose end.

4,312,526

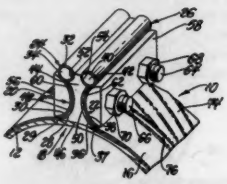
PIPE COUPLING WITH OPEN SLEEVE

Thomas R. Cassel, 226 Shirley, Birmingham, Mich. 48009

Continuation of Ser. No. 31,651, Apr. 19, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,996
Int. Cl.³ F16L 21/06
U.S. Cl. 285—419 **11 Claims**

1. In a pipe coupling of the type comprising a sleeve adapted to receive one pipe inside one end and another pipe inside the other end, said sleeve having a cross section including a roundish sector and a radially projecting channel shaped sector,

force applying means connected with the channel-shaped sector and adapted to act on the sleeve for deforming the sleeve to change the cross sectional dimensions thereof to stretch the sleeve around said pipes, the improvement wherein said channel-shaped sector comprises a pair of sidewalls extending outwardly from the roundish sector and being separated from each other at the outer ends to form an opening in the sleeve, a spline disposed between the sidewalls and having a concave surface opposite each sidewall, a pair of bars each having a convex surface, one bar being disposed against one sidewall opposite one concave surface of the spline and the



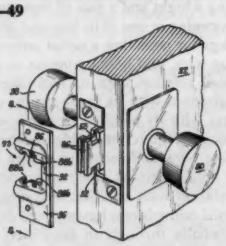
other bar being disposed against the other sidewall opposite the other concave surface of the spline, each of said sidewalls having a retaining member on the outer edge thereof and disposed outwardly of the spline and the respective bar, said retaining members having a greater thickness than the respective sidewalls, said force applying means including at least one bolt and nut with the bolt extending laterally through the bars, sidewalls and spline and being adapted to draw the bars together and force the sidewalls against the concave surfaces of the spline with said retaining members being trapped against the outer surfaces of the spline and bars whereby the sleeve may be stretched around said pipes.

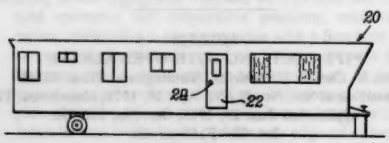
4,312,527

COMPACT AMBIDEXTROUS LOCKING MECHANISM

Edward F. Tannery, Coldwater, Mich., assignor to Theodore Bargman Company, Coldwater, Mich.

Filed Mar. 25, 1980, Ser. No. 133,913
Int. Cl.³ E05C *3/06*
U.S. Cl. 292—49 **5 Claims**





1. A compact, ambidextrous locking mechanism comprising:

a lock casing adapted to be fastened on an edge of a door and a strike adapted to be fastened to a door jamb opposite said casing;

said casing including a pair of support plates fastened together in spaced relation and having mutually facing inner, parallel surfaces defining a space therebetween;

said plates having identical, spaced, congruent, T-shaped tongues along corresponding edges adapted to extend outwardly beyond the edge of the door into said strike, each of said tongues comprising a central stem and a relatively wider head at the outer end thereof defining a pair of recesses under opposite ends of the head;

a pair of flat, blade-like bolt members having coplanar shank portions located side-by-side in the space between said support plates in slideable, constrained relation with said inner parallel surfaces, and having latch portions located side-by-side between said T-shaped tongues and simultaneously movable between closed and open positions in said recesses, said bolt members being pivotally connected to said support plates intermediate said shank and blade portions;

a flat eccentric, plate-like cam member intermediate said shank portions and coplanar therewith in said space between said support plates in slidable, constrained relation with said inner parallel surfaces, said cam member being movable by shaft means journaled in said support plates, said shaft means being connected to manually operable means; spring means pressing said shank portions against said cam member;

said cam member being movable by said shaft means to move the latch portions selectively between their said closed and open positions; said latch portions being expanded into said recesses in said closed position for engaging said strike, and being contracted within said recesses in said open position for disengaging said strike; and

said strike comprising a C-shaped plate having a pocket defined by upper and lower horizontal marginal walls and a back marginal wall, said plate having a passageway opposite said back wall wide enough to enable movement of said central stems of said tongues therethrough into said pocket with the heads of said tongues engaging the undersides of said upper and lower walls, said upper and lower walls having pairs of sawtooth notches for holding said latch portions of the bolt members when in closed positions.

4,312,528

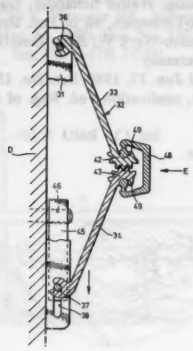
PANIC BOLT ASSEMBLY

John L. Hall, Maidenhead, and Anthony S. Peck, Belper, both of England, assignors to PLC Engineering Company Limited, London, England

Filed Nov. 7, 1979, Ser. No. 91,888
Int. Cl.³ E05C *15/02*
U.S. Cl. 292—92 **5 Claims**

1. A panic bolt assembly for use on an emergency exit door, which panic bolt assembly comprises a bolt mounted on the door at at least one end of the vertical edge of the door remote from the hinged vertical edge and constrained to move substantially vertically with respect to the door and, operatively coupled to the bolt, a substantially horizontal elongate operating device which is mounted substantially horizontally across the width of the door and which comprises two substantially horizontal elongate bodies arranged alongside one another and having along adjacent substantially horizontal edges toothed substantially arcuate surfaces which inter-engage to form a hinged connection, each of which elongate bodies is pivotally mounted on the door about a substantially horizontal axis adjacent the edge of the elongate body that is remote from said hinged connection and at least one of which pivoted edges is constrained to move substantially vertically with respect to the door to effect engagement or disengagement of said bolt, and a separately formed elongate cover pivotally mounted on each elongate body and shrouding said hinged connection, the

arrangement being such that pressure imparted to the hinged connection of the operating device in a direction towards the



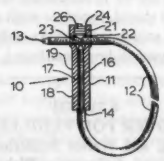
door effects vertical movement of said pivoted edge or edges to disengage said bolt.

4,312,529

SCREW TUBE LOCK

Robert H. Gillette, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Apr. 9, 1980, Ser. No. 138,710
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—315 **5 Claims**



1. A screw tube lock comprising a tube member with a central opening, one end of a flexible cable received within said one end of said central opening and locked within said tube member by pressure to form a flattened portion on said tube member, indicia printed on said flattened portion, a transverse opening formed through said tube member adjacent the second end, the second end of said flexible cable receivable in said transverse opening, and a locking means engageable with said cable to lock it in said transverse opening.

4,312,530

CHOPSTICKS ASSEMBLY

Nien-Tzu Young, 2000 E. Delores St., West Covina, Calif. 91792

Filed Jun. 2, 1980, Ser. No. 155,062
Int. Cl.³ A47G *21/10*
U.S. Cl. 294—16 **1 Claim**

1. In a chopsticks assembly,

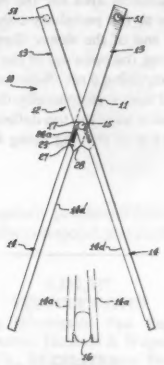
(a) a pair of elongated chopsticks,

(b) pivot means interconnecting the chopsticks to allow scissors pivoting thereof in generally the same plane, and about a pivot axis, the chopsticks each including a handle at one longitudinal side of the pivot means, and a tong at the opposite longitudinal side of the pivot means,

(c) a spring biasing the chopsticks to a spread apart position and allowing finger pivoting thereof toward a closed position so that the tongs may pick-up an edible,

(d) retention means to releasably retain the chopsticks in said closed position, said retention means including a shallow protrusion on one handle and a shallow recess on the other handle to releasably receive the protrusion when the handles are closed together, said recess and protrusion having associated interengageable detent shoulders in spaced relation to the pivot means, said shoulders characterized as interfitting in such shallow and loose configuration as to be freed of interengagement in response to impact jarring of the closed together tongs,

(e) the handles extending in overlapping relation in the direction of the pivot axis, as the handles pivot, the tong and handle of each chopstick having a juncture at which they extend in offset V-shaped configuration, in spaced



relation to said pivot means, the closed together tongs having a rectangular outline, and the closed together handles having a rectangular outline, and

(f) the spring being a torsion spring with arms extending in recesses defined by the handles proximate said pivot axis, said recesses and arms therein extending in the elongation direction of the chopsticks,

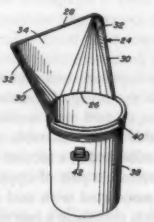
(g) the tongs defining a common plane, normal to said axis, and the chopsticks interfitting in said closed position, with the handles extending in face to face relation in a first direction parallel to said axis, and the tongs extending in face to face relation in a second direction normal to said first direction.

4,312,531

FILLING AID FOR PLASTIC TRASH BAGS AND THE LIKE

Richard H. Cross, 2006 Le Suer Rd., Richmond, Va. 23229

Filed Jun. 25, 1980, Ser. No. 162,898
Int. Cl.³ B65D *67/12*
U.S. Cl. 294—55 **6 Claims**



1. For use in combination with a self-sustaining receptacle for the loading of a bag of flexible material, the receptacle having a closed bottom and a rim defined open top, said bag having a closed bottom and an open top; a filling aid, said aid

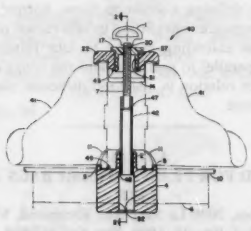
including a protective sleeve positionable within a receptacle-received bag for a sandwiching of the bag between the sleeve and the surrounding receptacle, said sleeve including an open inner end positionable adjacent the bottom of the bag, and an open outer end including means for engaging and clamping the open top of the bag to the open top of the receptacle peripherally thereabout, said filling aid further including a scoop extending longitudinally from the outer end of the sleeve, said scoop having an inner edge conforming to and integral with the outer end of the sleeve about a substantial portion of the periphery thereof, said scoop further including a planar central portion with a straight outer edge and opposed sides formed to define a smooth transition area for the movement of debris from the outer edge to the periphery-conforming inner edge and the open outer end of the sleeve thereat, said means for engaging and clamping the open top of the bag to the open top of the receptacle comprising a reversely turned edge flange on the outer end of said sleeve peripherally thereabout, said edge flange being engageable over the top defining rim of the receptacle with the open top of the bag being frictionally retained therebetween.

4,312,532

DEVICE FOR CARRYING AND SECURING SKIS, BOOTS AND POLES AND PROCESS FOR USE

John M. Crump, Jr. 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Jul. 13, 1979, Ser. No. 57,306
Int. Cl.³ A45F *5/10*
U.S. Cl. 294—147 **29 Claims**



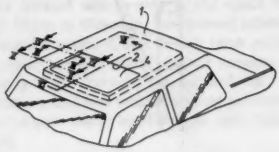
1. A device for carrying and/or securing any desired combination or individual units of equipment such as skis, poles and boots, comprising, a lower body portion cooperating with a relative separable upper body portion for selective adjustable separation, said body portions being connected by means of an upstanding centrally disposed stem section having said upper body portion adjustably engaged thereto and a hand grasp coupled to a top end of said stem section, said upper body portion having operable means rotatable in a first direction for increasing said separation and in a second reverse direction for decreasing said separation, a pair of oppositely disposed boot toe retaining means associated with said upper body portion, said lower body portion enclosing a pair of ski and pole receiving chambers which diverge generally outwardly from within said lower body, said upper body having a skirt portion for cooperating with said ski and pole receiving chambers, and means associated with said upper body portion for releaseably and adjustably securing said separation at a selected location corresponding to the size of equipment installed therein.

4,312,533

SLIDING ROOF FOR MOTOR VEHICLES

Hans Jardin, Inning; Walter Schätzler, Gauting, and Werner Sielk, Erftstadt-Lechenich, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH and Co., Munich, Fed. Rep. of Germany

Filed Jun. 11, 1980, Ser. No. 158,362
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923888
Int. Cl.³ B60J *7/10*
U.S. Cl. 296—214 **14 Claims**



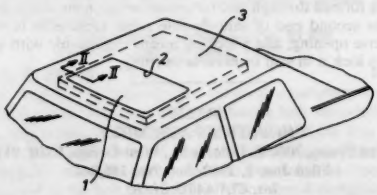
1. Sliding roof assembly for motor vehicles comprising a translucent, rigid sliding cover, said cover closing a roof opening of a fixed roof part in its closed position and being lowerable down and out of the latter and being slidable behind a rear roof part to an open position, lateral tracks mounted on the fixed roof part to guide the sliding cover, and approximately U-shaped shield, running along the lateral edges and forward edge of the sliding cover, and being displaceable together with the sliding cover, and a sliding headlining, said sliding headlining being slidable independently of said sliding cover and covering the sliding cover in its closed state, wherein lateral legs of the U-shaped shield, together with at least a portion of an upper surface of said lateral tracks delimit guide channels for lateral edges of said sliding headlining.

4,312,534

RIGID COVER FOR VEHICLE ROOFS

Hans Jardin, Inning, and Walter Schätzler, Gauting, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH and Co., Munich, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,277
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 7912486[U]
Int. Cl.³ B60J *7/00*
U.S. Cl. 296—216 **12 Claims**

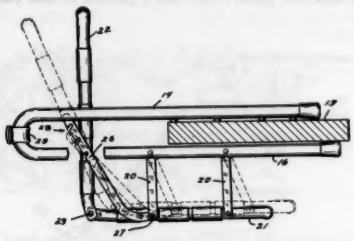


1. Rigid cover assembly for vehicle roofs, said cover opening and closing a roof opening in its opened and closed positions, respectively, comprising a cover panel, and a mounting frame abutting against the underside of the cover panel and extending along at least a part of the circumference of the cover panel, said mounting frame having a sealing section fitting around at least a part of the circumference of the cover panel, characterized by the fact that the mounting frame comprises a flange which is bent upward and projects outward beyond the circumference of the cover panel and onto which flange said sealing section is pushed on from above.

4,312,535
CLAMP MOUNTED FOLDABLE PORTABLE BABY CHAIR

Robert D. Smith, 3758 E. Winegar Rd., Bancroft, Mich. 48414

Filed May 16, 1980, Ser. No. 150,249
Int. Cl.³ A47B *39/00*
U.S. Cl. 297—174 5 Claims



1. A clamp mounted mounted foldable portable baby chair for selective mounting upon a table top comprising:

a pair of spaced-apart substantially U-shaped elongate clamp support members having upper and lower horizontal support arm extensions adapted to clampably engage a table top therebetween;

at least one downwardly depending spaced-apart support link pivotally connected at the upper end thereof to each of said lower support arm extensions of said spaced-apart clamp support members;

a horizontally oriented seat bottom member pivotally connected along the sides thereof to the lower ends of said support links so as to be suspended below said spaced-apart clamp support members, said seat bottom member selectively retractable to a horizontal storage position between said clamp support members upon corresponding movement of said support links; and

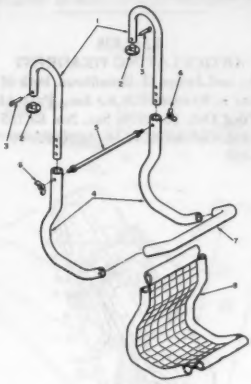
a vertically oriented seat back member pivotally connected along the lower edge thereof to the rear edge of said seat bottom member, said seat back member extending upwardly between said spaced-apart clamp support members, said seat back member pivotally connected at the sides thereof to said lower support arm extensions proximate to said U-shaped portions of said clamp support members, said seat back member selectively foldable forwardly to a horizontally oriented storage position between said spaced-apart clamp support members while causing corresponding movement of said seat bottom member to a retracted storage position thereagainst.

4,312,536
DUNK SEAT

Glenn C. Lloyd, Moraine, Ohio, assignor to Lo-Rich Enterprises, Inc., Miamisburg, Ohio

Filed Jun. 5, 1980, Ser. No. 156,595
Int. Cl.³ A47C *31/00, 5/10*
U.S. Cl. 297—217 3 Claims

1. A water-immersible seat comprising a hanger of two vertical rods hooked-shaped at their upper ends with means for securing such seat to a supporting member and having a series of evenly spaced passageways at their lower ends; an inverted ?-shaped back and seat bottom support of two vertical rods with a passageway in each of the hollowed-out upper ends which sleeve onto the lower ends of the rods of said hanger wherein the passageways of the two rods of said support align with the series of evenly spaced passageways of the two rods of said hanger; a horizontal tubular connector having both of its ends bent at a ninety degree angle which sleeve onto the lower ends of said support; a horizontal bar lock-connector for securing the lower ends of said support in height adjustable positions; and a back and seat bottom fish netting attached to

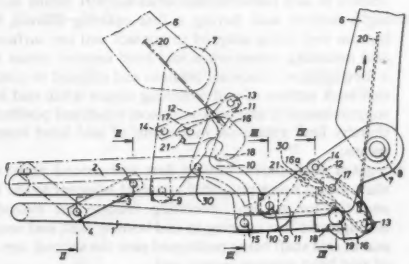


four tubes of rectangularly positioned fabric that sleeves onto the support, the tubular connector, and the bar lock-connector.

4,312,537
VEHICLE SEATS

Wilhelm Lindenberg, Wiedensahl, Fed. Rep. of Germany, assignor to P. A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen GmbH & Co., KG, Stadthagen, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,928
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854217
Int. Cl.³ A47C *1/032*
U.S. Cl. 297—317 9 Claims



1. In a vehicle seat

a sub-frame,

an upper seat-portion-carrying frame mounted on the sub-frame,

a back portion,

a pair of mounting members supporting the back portion and being pivotally secured to the upper frame,

a pair of constraining levers coupling the sub-frame and upper frame at positions remote from the back portion whereby to constrain the upper frame for limited longitudinal displacement with respect to the sub-frame, and

a pair of linkages,

each linkage including a bell crank, a lever, and securing means pivotally securing one end portion of the bell crank to the sub-frame, pivotally securing an intermediate portion of the bell crank to the upper frame, pivotally securing the other end portion of the bell crank to one end of the lever, and pivotally securing the other end of the lever to the mounting member,

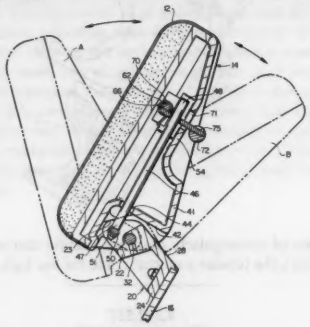
each linkage being arranged to displace the upper frame longitudinally of the sub-frame in response to pivoting of the mounting members.

4,312,538

ARTICULATING HEADREST

Joe H. Kennedy, and James H. Broadhead, both of Bay Minette, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 10, 1979, Ser. No. 83,735
Int. Cl.³ A47C *7/38*; A61G *15/00*
U.S. Cl. 297—408 **14 Claims**



1. An articulating headrest comprising:

means for mounting said headrest to a backrest of a chair, said mounting means having a top surface and a back surface;

head support means having a first, lower end and a second, top end, said head support means being pivotably attached at the first, lower end thereof to said mounting means and being rotatively movable forwardly and backwardly with respect to said backrest, said head support means including a bottom wall having a first opening therein, said bottom wall being adapted to contact said top surface of said mounting means when said head support means is at a forwardmost rotational position and adapted to contact said back surface of said mounting means when said head support means is at a backwardmost rotational position to thereby limit rotational movement of said head support means;

elongated shaft means having first and second ends, said shaft means being pivotably attached adjacent to the first end thereof to said mounting means and extending through said first opening in said bottom wall, said second end of said shaft being positioned near the second, top end of said head support means; and

unidirectional locking means positioned on said head support means near the second, top end thereof for releasably engaging said shaft means over a portion of the length of said shaft means intermediate the first and second ends thereof, said locking means preventing backward rotational movement of said head support means when said locking means is engaged with said shaft means and permitting forward rotational movement of said head support means when said locking means is either engaged or disengaged with said shaft means.

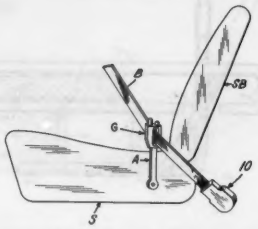
4,312,539

VEHICLE SEAT BELT GUIDE

Juichiro Takada, 3-12-1, Shinmachi Setagayaku, Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 109,983
Claims priority, application Japan, Mar. 17, 1979, 54-30566
Int. Cl.³ A62B *35/00*
U.S. Cl. 297—468 **5 Claims**

1. A belt guide for a vehicle occupant restraint belt system of the type having a belt retractor which exerts a generally constant retracting force on the belt comprising a frame having a passage for guiding the belt, a belt-turning guide roller mounted on the frame for rotation adjacent the passage and engaging the belt generally transversely, and a belt clamping member mounted on the frame for movement between a release position out of engagement with the belt and a stop position in which the clamping member clamps the belt against one of said belt guide roller and a portion of said passage to



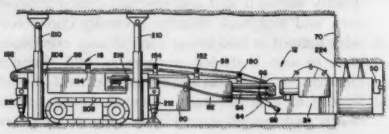
prevent retraction of the belt, wherein the belt clamping member includes a resilient arm having a lower end pivotably supported by the frame, a center portion positioned to clamp the belt against the guide roller and an upper portion received in an elongated guide slot in the top of the frame, the slot having a latching offset portion for retaining the clamping member in a position in which the belt is resiliently clamped between the center portion of the clamping member and the guide roller.

4,312,540

CONTINUOUS MINING APPARATUS AND METHOD

Thomas M. Thompson, Rte. 1, Box 122A, Beverly, W. Va. 26253

Filed Jun. 29, 1979, Ser. No. 53,439
Int. Cl.³ E21C *27/24, 35/20*
U.S. Cl. 299—11 **23 Claims**



1. A method for the primary mining of coal from an underground seam in a room-and-pillar manner comprising the steps of:

(a) providing a continuous miner having a cutter assembly, a variable length conveyor assembly and a base assembly, said conveyor assembly being positioned between said cutter assembly and said base assembly so as to convey coal from said cutter assembly to said base assembly while said cutter assembly is cutting, said cutter assembly being capable of moving outwardly into a coal face;

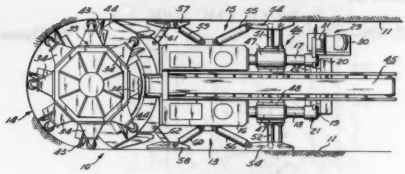
(b) positioning the continuous miner with the conveyor assembly in a retracted condition and with the base assembly in a stationary location substantially adjacent the exposed face of coal to be mined;

(c) causing the cutter assembly to extend outwardly into the coal face, the conveyor assembly providing variable length conveying means between the cutter assembly and the base assembly for the movement of coal from the cutter assembly to the base assembly, the cutter assembly being caused to extend outwardly at least sixteen (16) feet from its starting position.

4,312,541
HARD ROCK TRENCH CUTTING MACHINE HAVING ANCHORING AND STEERING STRUCTURE

Weslin Spurgeon, Seattle, Wash., assignor to Jarva, Inc., Solon, Ohio

Filed Mar. 24, 1980, Ser. No. 133,585
Int. Cl.³ E21D 9/10
U.S. Cl. 299—31 **6 Claims**



1. A hard rock trench cutting machine for cutting a trench having an end face, two opposed sidewalls, a bottom wall, an open top, a longitudinal axis extending parallel to said sidewalls and to said bottom wall, and a lateral axis extending between said sidewalls perpendicular to said longitudinal axis and parallel to said bottom wall, said machine comprising a main body assembly and a cutter wheel and a longitudinal thrust assembly movable along said longitudinal axis with respect to said main body assembly and said cutter wheel, cylinder means on said longitudinal thrust assembly transversely mounted with respect to the longitudinal axis of said main body assembly, piston means extending axially from each end of said cylinder means and carrying means adapted to bear against opposed walls of the trench, each of said piston means having an end face within said cylinder means which, together with an inner sidewall of said cylinder, comprise a pressure chamber adapted to force said piston means against said opposed sidewalls, said main body assembly and said cylinder means being adapted to move laterally relative to said piston means with said pressure chamber pressurized, said cutter wheel being rotatably carried by said main body assembly for rotation about a rotational axis relative to said main body assembly, said rotational axis being substantially perpendicular to said lateral axis, a plurality of individual cutters mounted on said cutter wheel for engaging said trench end face, said individual cutters extending along said trench end face continuously from said bottom wall to said open top, rotational drive means rotating said cutter wheel about said rotational axis relative to said main body assembly, extensible means between said piston means and said main body assembly for forcing the main body assembly and said cutter wheel forwardly with respect to said longitudinal thrust assembly to progressively cut a trench, and steering means to shift said main body assembly laterally relative to said piston means and about said central axis.

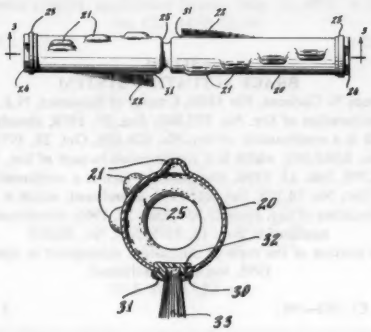
4,312,542
METHOD OF MAKING A BRUSH-BEATER FOR A VACUUM CLEANER

Harold W. Schaefer, Bloomington, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Division of Ser. No. 911,978, Jun. 2, 1978, Pat. No. 4,209,873.
This application Jan. 7, 1980, Ser. No. 110,099
Int. Cl.³ A46B 7/10; A46D 1/08, 3/00
U.S. Cl. 300—21 **7 Claims**

1. A method for forming a rotatable brush-beater assembly for a vacuum cleaner, comprising the steps of outwardly deforming a thin wall tube by applying fluid pressure inside of said tube without outside support, to form radially outwardly projecting axially spaced short beater projections extending in a line, and then affixing a brush assembly to said tube at a location circumferentially displaced from said projections.

4. A method for forming a rotatable brush-beater assembly for a vacuum cleaner, comprising the steps of providing a thin wall tube of deformable material, placing said tube on a hollow mandrel having radially extending ducts, applying fluid pressure to the hollow interior of said mandrel without outside

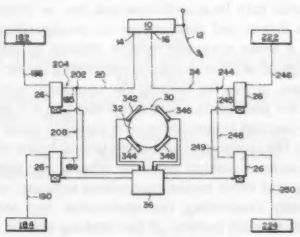


support of said tube, whereby the pressure thereby exerted on said tube forms axially space short projections extending in a line thereon, and then providing axially extending slits in said tube and urging brush assemblies axially into said slits.

4,312,543
CONTROL DEVICE FOR A VEHICLE HYDRAULIC BRAKING SYSTEM

Hitoshi Kubota, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 4, 1980, Ser. No. 109,485
Claims priority, application Japan, Jan. 23, 1979, 54-5511
Int. Cl.³ B60T 8/12
U.S. Cl. 303—24 R **25 Claims**



1. In a hydraulic vehicle brake system having a master cylinder connected with an operating means, wheel cylinders corresponding to each of individual vehicle wheels and a hydraulic circuit connecting said master cylinder to each wheel cylinder, a control device comprising:

a means for measuring the relative ratio of a load applied to each individual wheel in relation to that of the remaining wheels;

a control circuit cooperatively associated with said load measuring means and generating control signals which are respectively representative of relative loads on respective corresponding wheels; and

a plurality of control valves respectively interposed between said master cylinder and said wheel cylinders in said hydraulic circuit, in which each of said control valves corresponds to one of said individual wheel cylinders and in which each control valve includes means for controlling the hydraulic pressure built up in the wheel cylinder independently and

corresponding to a signal value represented by the control signal fed to each individual control valve.

4,312,544

BRAKE ACTUATING SYSTEM

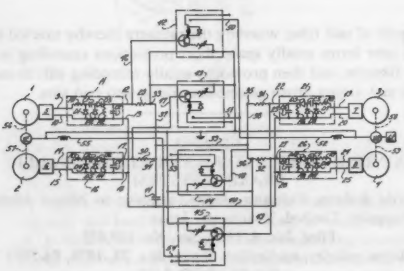
Thomas N. Cochran, Far Hills, County of Somerset, N.J. 07931

Continuation of Ser. No. 872,868, Jan. 27, 1978, abandoned, which is a continuation of Ser. No. 626,586, Oct. 28, 1975, Pat. No. 4,083,609, which is a continuation-in-part of Ser. No. 463,708, Feb. 15, 1974, abandoned, which is a continuation of Ser. No. 74,118, Sep. 21, 1970, abandoned, which is a continuation of Ser. No. 623,334, Dec. 20, 1966, abandoned. This application Jun. 19, 1979, Ser. No. 50,019

The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.

Int. Cl.³ B60T *8/10*

U.S. Cl. 303—96 **1 Claim**



1. In a vehicle having at least four wheels, at least two of which wheels may be non-driven and one or more of which wheels are driven and may assume an overspeeding or a skid condition, a brake actuating system utilized to influence the rotational speed of all said wheels comprising means for actuating the same, means for sensing the rotational speed of each wheel and for generating a signal representing the same, means for amplifying and transmitting each signal to valve means for controlling the application and reduction of brake effort to the braking system associated with the wheels, the improvement comprising said valve means comprising separate valve means for separately controlling the application and reduction of brake effort to each portion of the braking system associated with each wheel, means for sensing the differences in rotational speeds of each of the wheels, means for electrically communicating the sensed information to each of said separate valve means for selectively increasing and decreasing brake effort to each of the rotational speeds of said wheels as a function of the information received for varying the rotational speeds of said wheels, such that said valve means are selectively activated for applying brake pressure to any of the driven wheels in an overspeeding condition, and are selectively activated for reducing brake pressure to any of the wheels rotating at a speed substantially less than that of the fastest wheel, each said separate valve means also comprising means for directing the brake pressure produced at any such wheel to be applied through said brake actuating system to increase the brake pressure to all of the other wheels proportionately to the brake pressure relief at any of the wheels at which brake pressure is reduced, means connecting said brake actuating system and said sensing and communicating means for actuating said means for reducing pressure only when said brake actuating system is actuated.

4,312,545

TORQUE TRANSMITTING BEARING ASSEMBLY

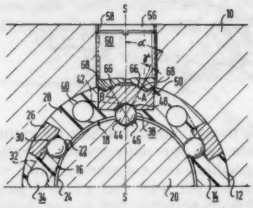
Günter Blaurock, Niederwerrn; Ernst Albert, Sand; Klaus Reichert, Kissingen-Garitz, and Rudolf Schlereth, Frauenroth, all of Fed. Rep. of Germany, assignors to Deutsche Star Kugelhalter GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 88,822, Oct. 26, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,427

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849758

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **13 Claims**



1. A bearing assembly for transmitting torque between a shaft and a housing having said shaft axially movably mounted therein comprising: a ball bushing interposed between said shaft and said housing, said ball bushing having a bushing axis and being received within a bushing receiving bore formed in said housing; ball rings guided within ball races of said ball bushing, said ball rings including at least one ball ring having a load-bearing ball ring section supported radially inwardly against said shaft and radially outwardly against said ball bushing for transmitting torque therebetween; a race groove formed in said shaft having one side of said load-bearing ball ring section of said at least one ball ring engaged therein in a torque transmitting manner; a bearing plate mounted in said ball bushing and defining therein a race groove having the side opposite said one side of said load-bearing ball ring section engaged therein in a torque transmitting manner; radial clamping means for applying to said bearing plate a radially inwardly directed clamping force pressing said bearing plate against said opposite side of said load-bearing ball ring section; and means defining generally complementary contact surface means through which said radial clamping means abuts against said bearing plate, said contact surface means being oriented to intersect resultant planes generated by torque transmitting forces transmitted through said torque transmitting ball ring which are parallel to said bushing axis at an angle to insure a self-locking action.

4,312,546

JOURNAL BEARING FOR HIGH-SPEED TUBULAR SHAFT

Oswald Bayer, Aidhausen; Werner Heinz, Obbach, and Georg Rudloff, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 90,986

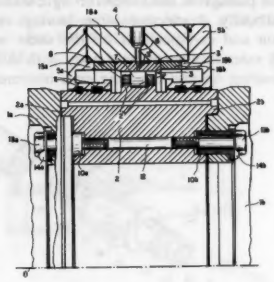
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848778

Int. Cl.³ F16C *19/26, 33/46, 33/58, 33/66*

U.S. Cl. 308—187 **5 Claims**

1. In a rotary machine wherein a hollow shaft adapted to be driven at high speed comprises a plurality of tubular sections, any two adjoining sections being interconnected by a coupling sleeve coaxial therewith, each coupling sleeve being rotatably supported in an associated cylindrical housing by a journal bearing including an inner race on said coupling sleeve, an outer race tightly fitted into said housing and a set of rotary bodies between said races,

the improvement wherein said inner race is an integral circular ridge of said coupling sleeve rising from an outer peripheral surface thereof, said housing being flanked by a



pair of annular disks with shoulders extending axially into said housing from opposite ends thereof, said outer race being held in position by said shoulders.

4,312,547

SEAL FOR BEARINGS

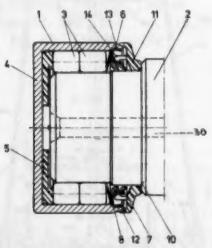
Richard Negele, Esslingen-Rudern, and Wilhelm Birkenmaier, Weinstadt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,808

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908713

Int. Cl.³ F16C *33/78*

U.S. Cl. 308—187.1 **10 Claims**



1. In a bearing wherein a machine element has a cylindrical surface, a bearing element surrounds said cylindrical surface, a first sealing ring is provided in the bore of the bearing element, the sealing ring sealingly engaging said cylindrical surface, and wherein a second elastic sealing ring is provided between an open end of the bearing element and a shoulder of the machine element adjacent the cylindrical surface, the bearing element, first sealing ring and second elastic sealing ring forming a unitary component; the improvement wherein said second elastic sealing ring has an axially extending ring-shaped collar extending into said open end of said bearing element, said first sealing ring having an annular surface, said collar engaging said annular surface of said sealing ring.

4,312,548

DRAWER UNIT FOR STORING CASES NORMALLY CONTAINING MAGNETIC TAPE CASSETTES

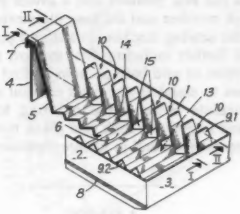
Patrick Posso, 10 avenue Jurigoz, Lausanne, Switzerland (CH 1006)

Filed May 7, 1980, Ser. No. 147,581

Claims priority, application France, May 14, 1979, 79 12219

Int. Cl.³ A47B *63/00*

U.S. Cl. 312—9 **4 Claims**



1. A drawer unit for storing cases normally containing magnetic tape cassettes comprising: a pair of spaced apart side walls; a bottom; and a plurality of inclined separator partitions cooperating with the side walls and bottom to define compartments in which cases may be stored so that the transparent top of their cover is inclined to facilitate reading of what is written on the cassette contained in the case in question; each separator partition being inclined downwardly to the rear and upwardly to the front and comprising two aligned parts which are separated from each other by a gap, each of said parts having a side edge connected to one of said side walls and having a lower edge connected to said bottom of said drawer unit; said bottom presenting, over at least a part of its extent, a serrated section of which certain portions extend the partitions and other sloped portions are perpendicular to and connected to said parts of said partitions, said serrated section facilitating the lower support of the cases and rigidifying the drawer unit.

4,312,549

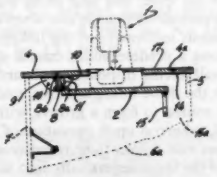
MOUNTING ARRANGEMENT FOR A SEWING MACHINE

Lucien Ravenelle, 187 Saint Francois St., St. Pie de Bagot, Prov. of Quebec, Canada

Filed Apr. 24, 1980, Ser. No. 131,202

Int. Cl.³ A47B *81/00*; D05B *75/00*

U.S. Cl. 312—21 **7 Claims**



1. A mounting arrangement for a sewing machine comprising a cabinet having a top plate, a front wall, a rear wall and side walls, said top plate having a generally rectangular aperture longitudinally extending intermediate said front and rear walls, an elongated narrow plank member pivotally secured at its rear longitudinal edge to the rear longitudinal edge of said aperture of said top plate, a flat base plate adapted to fill said aperture in combination with said plank member, said base plate serving as a support for a sewing machine having a free arm and fixed to said base plate with said free arm spaced

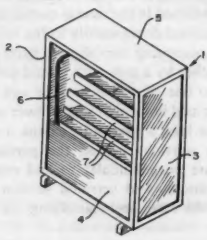
upwardly from the top surface of said base plate, said base plate being pivotally secured along its rear longitudinal edge to the front longitudinal edge of said plank member, the assembly of the base plate and plank member capable of taking three positions namely a top position in which the base plate and plank member are substantially coplanar and level with the top plate to maintain the sewing machine in a free arm position, an intermediate position in which the plank member extends downwardly and substantially vertically from the top plate and the base plate is generally horizontal to maintain the sewing machine in a flat bed position and a lower position in which both the plank member and the base plate extend downwardly to maintain the sewing machine in a stored position within the cabinet, sand further including first support means to engage the front portion of said base plate in its first position, second support means to maintain the front portion of said base plate in its intermediate position and indexing locking means to removably and selectively lock said plank member to said top plate in its top position and in its intermediate position respectively.

4,312,550

REVOLVING DISPLAY CASE

Kenneth E. Jackson, Owensville, Mo., assignor to Jahabow Industries, Inc., Owensville, Mo.

Filed Jun. 2, 1980, Ser. No. 155,293
Int. Cl.³ A47B *63/06*; B65G *19/00*
U.S. Cl. 312—268 **12 Claims**



1. A display case for use in exhibiting jewelry or various other merchandise, and being of the type incorporating a series of revolving trays for furnishing sequentially and eventually direct viewing of all of the shelved merchandise, the structure of said case including a pair of sidewalls being spaced apart a fixed distance, a pair of drive linkages, one drive linkage being operatively associated with the sidewalls, said trays at each end being suspended upon the pair of drive linkages, drive means provided within the case, and said drive means operatively connecting with each drive linkage and when energized inducing the simultaneous movement of the linkages and their suspended trays along a predetermined course about the display case, each sidewall having disposed tracks arranged therewith and upon which the drive linkages move, said sidewall tracks being integrally routed to form a groove within the structure of each sidewall, whereon upon operation of the drive means the drive linkages ride within their respective sidewall tracks for movement of the trays sequentially into viewing positions.

4,312,551

PIPE FITTING

Anthony Mascolo, Islip Terrace, and Albert Helrigel, Bay Shore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

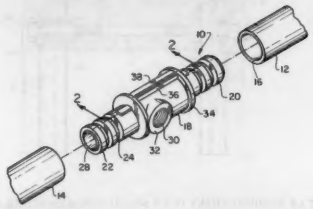
Filed Jan. 17, 1980, Ser. No. 112,849
Int. Cl.³ F16L *11/12*
U.S. Cl. 339—14 R **10 Claims**

1. A pipe fitting for connecting pipes comprising:

a substantially cylindrical body having at either end thereof co-linear cylindrical male coupling ends that are inserted into the bores at the ends of pipes for connecting said pipes, said body and coupling ends being fabricated out of an electrically non-conductive material;

a first longitudinal bore through said body and coupling ends for the passage of fluid therethrough; and

an electrically conductive strap having an intermediate portion and end portions on the outer surface of said fitting extending across said body with said end portions terminating on said coupling ends intermediate the ends



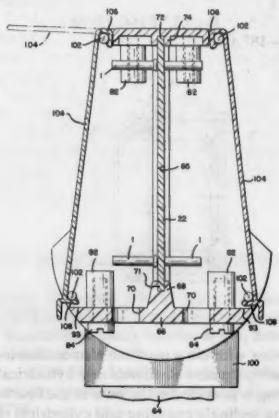
thereof, said strap being embedded in the outer surface of said fitting with the upper portion of at least said intermediate and said end portions of said strap protruding therefrom such that said end portions provide electrical contact with the bores of the pipes being connected such that electrical continuity across said fitting is provided by said strap and whereby said intermediate portion is exposed so that grounding and bonding means can be readily clamped thereagainst.

4,312,552

CROSS CONNECT APPARATUS

Richard L. Hughes, and Ned A. Sigmon, both of Clemmons, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

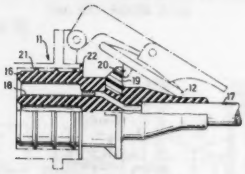
Filed May 15, 1980, Ser. No. 149,777
Int. Cl.³ H01R *13/44*, *9/00*
U.S. Cl. 339—36 **3 Claims**



1. In a cross connect apparatus having electrical terminals arranged on opposite sides of a terminal board, and a frame for pivotably mounting the terminal board, the improvement comprising:

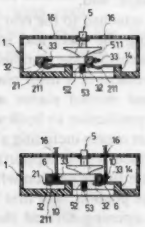
cover means for protecting the terminals and wiring connected thereto, said cover means having hook portions pivotably hooked over pins provided on said frame, and said cover means having hook shaped edges latchably engaging additional pins provided on said frame.

4,312,553
ELECTRICAL CONNECTION DEVICE
Ralph O. Lyckesjö, Harestad, Sweden, assignor to AB Volvo, Gothenburg, Sweden
Filed Dec. 26, 1979, Ser. No. 107,081
Claims priority, application Sweden, Jan. 8, 1979, 7900145
Int. Cl.³ H01R *13/502*
U.S. Cl. 339—60 M 5 Claims



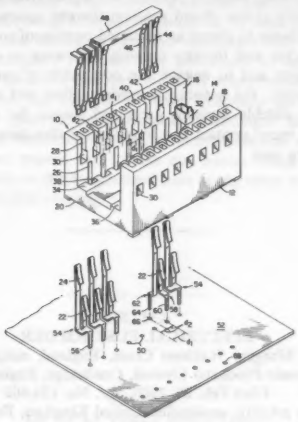
1. In an electrical connection device for connecting electrical cables, comprising a first connecting member with a socket which has a first opening, a second connecting member which can be inserted into said first opening; the improvement in which the first connecting member has an inner part of soft elastic material in which an end of a cable is embedded, and a surrounding casing of rigid material, which is fixed to the inner elastic part, the socket having a second opening opposite the first opening, the casing being insertable in said second opening so that plug means, connected to said cable end, point towards the first opening, and the inside of the socket and the outside of the casing having means cooperating with each other to achieve a releasable connection between the casing and the socket.

4,312,554
ELECTRIC SAFETY SOCKET WITH INTERNAL LOCKING MEANS
Wei-Kung Wang, No. 14, Alley 3, La. 61, Yen Chiy Yuan Rd., Sec. 2, Nan Kang District, Tai Pai, Taiwan
Filed Jan. 30, 1980, Ser. No. 116,715
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—74 R 5 Claims



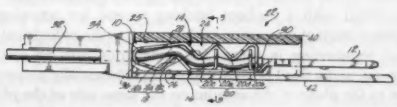
1. An electric safety socket with internal locking means, comprising an insulated casing (1), an insulated laterally movable member (3) having a pair of spaced bars (33) for insertion into the contact blades of a plug in a locked position by means of a spring in order that a pair of contact members (4) arranged on said contact bars (33) can be brought into engagement with said contact blades when said plug is inserted into the socket, a pair of spring retainers (2) for retention of said laterally movable member (3) in unlocked position, and a pair of actuators (5) for movement of said laterally movable member.

4,312,555
RECEPTACLE FOR STACKING ELECTRONIC PACKAGES
Charles J. Donaher, Los Altos Hills, and Gordon D. Christensen, San Jose, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.
Filed Oct. 17, 1979, Ser. No. 85,767
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—75 MP 29 Claims



1. A receptacle for supporting electronic packages in stacked relation and providing electrical connection to contacts of said packages, comprising:
an upstanding housing defining a channel for receipt of said packages and supporting such received packages in vertically spaced relation in said channel;
contact means supported in said housing in vertically spaced relation and in noninterfering disposition with respect to said channel; and
actuator means movably supported in said housing for displacing said contact means from such noninterfering disposition with respect to said channel into engagement with said contacts of said received packages.

4,312,556
ELECTRICAL CONNECTOR
Oscar Dufau, 1420 Calle Grande, Fullerton, Calif. 92635
Continuation of Ser. No. 914,893, Jun. 12, 1978, abandoned.
This application Apr. 2, 1980, Ser. No. 136,526
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—99 R 8 Claims



1. An electrical connector having a contact providing combined strain relief and insulation piercing for an elongated insulated conductor, the connector comprising:
a spring metal contact member elongated in a longitudinal direction thereof and having a contact end and a portion wrapped longitudinally back over itself to form first and second overlapping contact member portions, the overlapping contact member portions being formed therebetween with at least one insulation cutter and at least one strain relief

clamp, the strain relief clamp being spaced from and on the opposite side of the cutter from the contact end; and

a nonconductive housing defining a chamber therein for receipt of at least a portion of the overlapping contact member portions, the chamber having opposing sides spaced so that upon positioning the overlapping contact member portions therebetween, while an insulated conductor is positioned between the cutter and the strain relief clamp, the overlapping contact member portions are forced from an open to a relatively closer closed position thereby causing the strain relief clamp to clamp an insulated portion of such insulated conductor and thereby causing the cutter to displace the insulation and to engage the conductor of such insulated conductor, the housing comprising first and second relatively slidable housing parts and means for affixing the spring metal contact in a longitudinal direction on the first housing part.

4,312,557

ELECTRICAL FUSEHOLDER

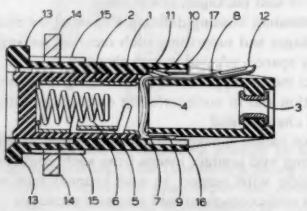
John T. Morgan, Waltham Cross, England, assignor to Pye (Electronic Products) Limited, Cambridge, England

Filed Feb. 25, 1980, Ser. No. 124,402

Claims priority, application United Kingdom, Feb. 27, 1979, 06833/79

Int. Cl.³ H01R *13/68*

U.S. Cl. 339—130 R **3 Claims**



1. A panel-mountable fuseholder for a cartridge fuse, which comprises a substantially cylindrical body open at one end and closed at the other end; a closure member for the open end; a first electrical contact adjacent to the closed end; a second electrical contact intermediate the open end and the closed end, said second contact having an annular first portion, a second portion extending substantially perpendicular to the plane of the annulus outside the cylindrical body and being provided with a resilient latching tongue for retaining said second contact in position with respect to the cylindrical body and terminating in means for connection into an electrical circuit, and a third portion extending substantially perpendicular to the plane of the annulus on the same side of the plane as the second portion and arranged to co-operate with the cylindrical body to resist movement of the second contact when its second portion is bent away from the cylindrical body; the first contact and the second contact being arranged to make an electrical connection with the respective end caps of a cartridge fuse when one end cap of the cartridge fuse is gripped within the closure member and the closure member is inserted into the cylindrical body with the cartridge fuse projecting through the annular first portion of the second contact; and a third electrical contact in the closure member for electrically connecting said one end cap to the second contact.

4,312,558

FLUSH MOUNTED PLUG

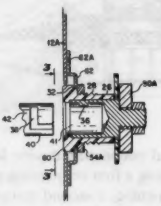
Peter C. Duerr, 4757 W. 175th Pl., Country Club Hills, Ill. 60477, and Claude De Facci, 22536 Lake Shore Dr., Richton Park, Ill. 60471

Continuation of Ser. No. 961,515, Nov. 17, 1978, abandoned.

This application Mar. 17, 1980, Ser. No. 130,585

Int. Cl.³ H01R *13/40*

U.S. Cl. 339—130 R **5 Claims**



1. A structure for mounting an electrical socket to receive the plug-in electrical connector of an electrical cable and for preventing relative movement of the electrical socket during use, the electrical socket including a flange portion with a first predetermined cross-sectional shape, a shank portion having a segment with a second non-circular predetermined cross-sectional shape extending from the rear surface of the flange portion, and an electrically conductive receptacle embedded in the shank portion to provide an electrical contact surface for the plug-in electrical connector, said structure comprising:

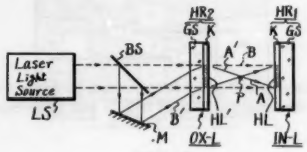
(a) a panel means for securing the electrical socket against lateral movement in a first plane, said panel means having a first opening formed therein to receive the flange portion of the electrical socket with minimal clearance, said panel means also having an edge defined by said first opening to support the flange portion of the electrical socket such that any lateral forces in said first plane tending to move the electrical socket laterally bear instead against said edge in a manner which prevents lateral movement of the electrical socket, said first opening having a contour corresponding to the first predetermined cross-sectional shape, and;

(b) a bracket means attached to the rear surface of said panel means for securing the electrical socket against lateral movement in a second plane parallel to said first plane, against axial movement in a third plane perpendicular to both said first and second planes and against rotation about an axis perpendicular to both said first and second planes, said bracket means including a first bracket portion having a first surface which supports the rear surface of the electrical socket flange portion when said first opening receives the flange portion, said first bracket portion also having a second opening formed therein to receive the electrical socket shank portion when said first opening receives the flange portion, said second opening having a contour corresponding to the second, non-circular predetermined cross-sectional shape, said bracket means also including a second bracket portion connecting said first bracket portion in spaced relationship to the rear surface of said panel means such that the front surface of the electrical socket flange portion is flush with the front surface of said panel means when the rear surface of the flange portion is supported by said front surface of said first bracket portion.

4,312,559
METHOD OF PRODUCING AN INLINE HOLOGRAM LENS

Chiaki Kojima; Hiroshi Ohki, and Kayoko Hasegawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 1, 1980, Ser. No. 145,687
Claims priority, application Japan, May 7, 1979, 54-56206; May 25, 1979, 54-71043[U]; May 7, 1980, 55-56205
Int. Cl.³ G02B 5/32
U.S. Cl. 350—3.72 **13 Claims**



1. A method of producing an inline hologram lens, comprising the steps of:

recording on a first photo-sensitive layer a holographic interference pattern which results from simultaneous exposure of said first photo-sensitive layer to a reference wave beam and to a subject wave beam, said beams being off-axis in respect to each other with said subject wave beam being incident perpendicular to said first photo-sensitive layer;

developing said first photo-sensitive layer to form an off-axis hologram lens;

positioning a second photo-sensitive layer on axis and parallel to said off-axis hologram lens;

providing an off-axis beam having a wave frot essentially identical to said reference wavebeam to be incident on said off-axis hologram lens to produce a subject wave beam incident on said second photo-sensitive layer;

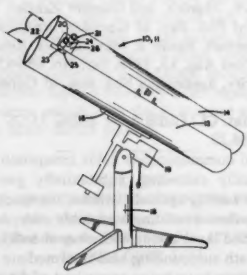
providing, simultaneously, a reference beam incident on said off-axis hologram lens and passing essentially undeviated, therethrough to be incident on said second photo-sensitive layer as a reference wave beam; and

developing said second photo-sensitive layer to produce said inline holograms lens.

4,312,560
BINOCULAR REFLECTING TELESCOPE

Arthur H. Hale, Skaha Estates, R.R. 1, Okanagan Falls, British Columbia, Canada (V0H 1R0)

Filed Oct. 9, 1979, Ser. No. 83,170
Int. Cl.³ G02B 17/00
U.S. Cl. 350—27 **11 Claims**



11. A binocular reflecting telescope having a pair of generally similar telescope tubes disposed side by side with longitudinal axes thereof generally parallel to each other, each tube having a primary concave mirror adjacent an inner end thereof and an opening adjacent an outer end thereof to accept light from an object being viewed, each mirror being adapted to direct incident light from the object as a reflected first pencil of light rays, the telescope being further characterized by:

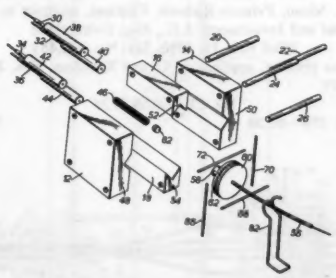
(a) each tube having a plane diagonal secondary reflector positioned to intercept the respective first pencil of rays which are reflected as a respective second pencil of light rays outwardly of the tube, the second pencils of rays of each tube being reflected generally in the same directions,

(b) each tube having an eye piece associated with a respective secondary reflector and positioned to receive the second pencil of light rays from the respective secondary reflector, the eye pieces being generally parallel and spaced apart at an appropriate interocular spacing to provide binocular viewing, an interocular axis extending between optical axes of the eye pieces being disposed obliquely to the longitudinal axes of the tubes to provide comfortable viewing.

4,312,561
OPTICAL FIBRE SWITCHES

John F. Mead, Princes Risboro, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Oct. 11, 1979, Ser. No. 83,864
Claims priority, application United Kingdom, Oct. 14, 1978, 40862/78
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 **6 Claims**



1. An optical fibre switch for aligning a first optical fibre with one of a plurality of second optical fibres, comprising a first cylinder having an axial hole for securement to the end of said first fibre, and a plurality of second cylinders of equal diameter each having an axial hole for securement to the end of one of said second optical fibres, a body having a multi-sided passage formed therethrough and defining an axis thereof, each of said second cylinders being secured inside said multi-sided passage so that each of said second cylinders is located by two adjacent sides of the multi-sided passage, the end faces of said plurality of second cylinders being in a plane perpendicular to the axis of said multi-sided passage, and means for moving said first cylinder relative to said second cylinders with its end face in said plane, the diameter of said first cylinder being equal to the diameter of said second cylinders, said first optical fibre being aligned with a given one of said second optical fibres when said first cylinder contacts said two adjacent sides of said multi-sided passage locating one of said second cylinders secured to the end of said given one of said second optical fibres.

4,312,562

OPTICAL CONTROL DEVICE

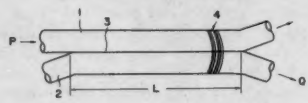
Hideo Segawa, Tokyo; Jiro Koyama; Hiroshi Nishihara, both of Suita, and Masamitsu Masuda, Toyonaka, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,823

Claims priority, application Japan, Feb. 19, 1979, 54/18058; Feb. 20, 1979, 54/18060

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.15 4 Claims



1. A optical control device comprising: a plurality of optical fibers arranged extremely adjacent to one another over a distance so that said optical fibers are optically coupled to one another; and ultrasonic transducer means arranged inside of said optical fibers, said means including transparent electrodes disposed on both sides of a piezo-electric film for exciting said optical fibers with ultrasonic waves equal or different in frequency and for propagating said ultrasonic waves substantially in parallel with the propagation direction of optical waves in said optical fibers, only a particular optical wave which is defined by the propagation constants of said optical waves and ultrasonic waves being selectively transmitted from one optical fiber to another optical fiber coupled to said one optical fiber.

4,312,563

CONNECTORS FOR SEALED CONTAINERS

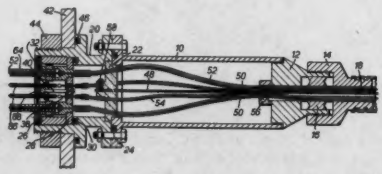
John F. Mead, Princes Risboro, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 19, 1980, Ser. No. 122,481

Claims priority, application United Kingdom, Feb. 27, 1979, 06959/79

Int. Cl.[3] G02B 7/26

U.S. Cl. 350—96.20 5 Claims



1. A connector for removably connecting the end of a cable to a hollow member, said cable comprising a plurality of optical fibres, each of said optical fibres being contained within a hollow tube, said connector comprising a housing sealingly connected to said end of said cable and a wall member sealing the end of said housing, said hollow tubes terminating and being sealingly attached to said wall member over holes formed through said wall member for the passage therethrough of said optical fibres, means for securing and sealing said optical fibres within said holes, said cable containing a strain filament, said strain filament being secured inside said housing to protect said optical fibres from tensile stress within said housing, said cable and said housing being pressurized and said pressure being maintained when said connector is removed from said hollow member.

4,312,564

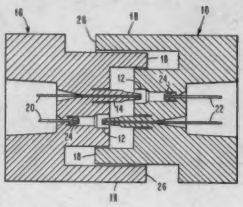
MULTI-FIBER OPTIC CONNECTOR

Frank P. Cefarelli, and Robert T. Evans, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,077

Int. Cl.[3] G02B 7/26

U.S. Cl. 350—96.22 5 Claims



1. A multi-fiber optic connector comprising:

a first and a second housing;

guiding means on said first and said second housing for mating with one another when said housings are interconnected;

a plurality of receptacles in said first housing each carrying a single fiber optic centered therein;

said receptacles each having at least three beam members equally spaced from one another and located centrally therein for holding the optical fiber adjacent the end thereof in a central position with the end of the fiber facing the top of the receptacle and parallel thereto;

a smaller diameter guidance means located within each of said receptacles;

a like plurality of flexible male members, each carrying a single fiber optic centered therein, extending from said second housing, one opposite each of said receptacles;

a tapered surface area on said male member adapted to cooperate with said smaller diameter guidance means in said receptacle to guide and bend said flexible male member to center it within said receptacle so that the fiber centered in said receptacle and the fiber centered in said male member abut coaxially with the ends lying in the same vertical plane.

4,312,565

GAS PRESSURE TIGHT OPTICAL CABLES

Ulrich Oestreich, Munich, and Guenter Zeidler, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 65,962

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1978, 2847382

Int. Cl.[3] G02B 5/16; H02G 15/20

U.S. Cl. 350—96.23 10 Claims

1. An optical communication cable comprised of:

a longitudinally extending, substantially gas-impermeable cable core having optical elements therein;

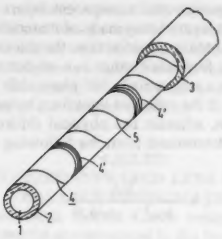
an inner sheath surrounding said cable core;

an intermediate layer about said inner sheath; and

an outer sheath surrounding said intermediate layer;

said intermediate layer being comprised of a spinning of yarn having a given width and being wound about said cable core with a given length of lay approximately equal to the diameter of said cable core and at select cable length

intervals said yarn being wound about said cable core with a substantially shortened length of lay, relative to said



given length of lay, to define space-free pressure windings compressing said core at such select intervals.

4,312,566

DIELECTRIC OPTICAL WAVEGUIDE CABLES

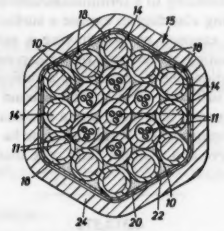
Lynden A. Jackson, Ipswich, England, assignor to The Post Office, London, England

Continuation of Ser. No. 835,440, Sep. 21, 1977, abandoned. This application Sep. 5, 1979, Ser. No. 72,632

Claims priority, application United Kingdom, Sep. 22, 1976, 39327/76

Int. Cl.[3] G02B *5/16*

U.S. Cl. 350—96.23 7 Claims



1. A dielectric optical waveguide cable of the type having a core structure and an outer sheath surrounding the core structure, said core structure comprising a plurality of longitudinally extending filamentary members of circular cross-section which have substantially equal diameters and which are closely stacked together in a stable configuration such that each filamentary member contacts at least one adjacent filamentary member, at least some of said filamentary members being strength members and at least one of said filamentary members being a polymer sleeve loosely enveloping a dielectric optical waveguide, the molecules of said polymer sleeve being orientated longitudinally of the sleeve, and wherein the outer sheath comprises an inner first layer formed by a corrugated tape wound spirally in a first sense around said strength members, a second layer formed by a corrugated tape wound spirally in a sense opposite to the first sense around the first layer, and an outer sheath portion.

4,312,567

REFLECTOR AND CADENCE COUNTER FOR JOGGERS

Leonard Sklair, 141 Madison Ave., Perth Amboy, N.J. 08861

Filed Aug. 5, 1980, Ser. No. 175,599

Int. Cl.[3] G02B *5/12*

U.S. Cl. 350—98 11 Claims

3. A reflector-cadence counter comprised of:

a circular reflector surface;

a transparent protective shield attached essentially in sealed relationship at the periphery of the reflector and covering the reflector surface, the shield having an inner surface displaced from the reflector surface;

a hard resilient disc located between the reflector and the inner surface of the shield;

wherein the distance between the reflector surface and the inner surface of the shield is slightly greater than the width of the disc; and

whereby interrupted movement of the reflector cadence-counter causes the disc to bounce in the space between the reflector and the transparent surface.

4,312,568

PROJECTION SCREEN ASSEMBLY

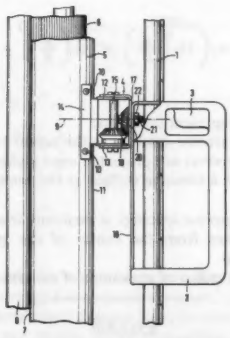
Ulli Weinberg, Roth, Fed. Rep. of Germany, assignor to Messrs. Reflecta GmbH Foto Film Projektion, Schwabach, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,703

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 7901492[U]

Int. Cl.[3] G03B *21/56*

U.S. Cl. 350—117 10 Claims



1. A projection screen assembly comprising: a stand having an essentially vertically extending longitudinal axis; a screen having two different projection surfaces on opposite sides; a housing accommodating the screen when rolled up and having a longitudinal axis and a slot permitting withdrawal of the screen from the housing; a mounting connecting the housing to the stand and so constructed that the housing can be turned from a vertical inoperative position essentially parallel to the stand, into two different horizontal operative positions; the mounting comprising two parts, a hinge connecting the two parts so as to permit pivotal movement about a pivot pin parallel to the longitudinal axis of the housing, the first part being fixed to the housing at the side thereof opposite to the slot, and the second part being pivoted to the stand about a horizontal axis transverse to the pivot pin, the slot in the housing in the vertical inoperative position thereof being disposed diametrically opposite to the stand in substantially one vertical plane with the longitudinal axis of the housing and the stand; and a

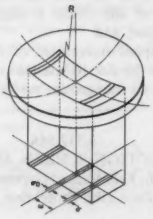
drive operatively coupling the two parts of the mounting and constructed such that, upon rotation of the housing in one direction or the other, out of the vertical inoperative position into one or the other respectively of the horizontal operative positions, the first part is positively pivoted to a position in which the slot in the housing is at the top and the screen can be pulled out of the housing with one or the other of the projection surfaces respectively directed away from the stand.

4,312,569

CONCAVE GRATINGS

Tatsuo Harada, Fuchu, and Toshiaki Kita, Hinodemachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,549
Claims priority, application Japan, Apr. 13, 1979, 54-44152
Int. Cl.³ G02B 5/18
U.S. Cl. 350—162 R **4 Claims**



1. In a concave grating having grooves formed in a concave blank surface, the improvement characterized by the provision of grooves in the concave surface which are so formed as to satisfy the following relationship:

$$\sigma = \sigma_o - \sigma_o\left\{2b_1\left(\frac{w}{R}\right) + 3b_2\left(\frac{w}{R}\right)^2 + 4b_3\left(\frac{w}{R}\right)^3\right\}$$

wherein

b_1, b_2 and b_3 represent constants;

σ_o represents groove spacings at the center of the gratings when the grooves are projected onto a plane which is in contact with a concave surface at the center of the grating;

σ represents groove spacings at positions w at right angles with the lines from the center of the grating to the grooves; and

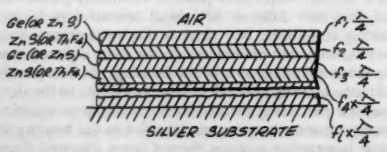
R represents a radius of curvature of the concave surface.

4,312,570

HIGH REFLECTIVITY COATED MIRROR PRODUCING 90 DEGREE PHASE SHIFT

William H. Southwell, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 14, 1979, Ser. No. 75,431
Int. Cl.³ G02B 5/28
U.S. Cl. 350—166 **7 Claims**



1. A high reflectivity mirror producing a substantially 90° relative phase shift between the s and p plane polarization components of the reflected light, comprising:

a substrate; and

a plurality of superimposed transparent layers on the substrate, adjacent layers being made of materials of substantially different indices of refraction, the thicknesses of the layers differing from each other in a predetermined manner to produce a substantially 90° phase shift in the s and p components of the reflected light for a broadband range of wavelenghts, wherein the physical thickness of each layer may be determined from the following equation:

$$t_i = \frac{\lambda_o f_i}{4(n_i^2 - \sin^2\theta_o)^{\frac{1}{2}}}$$

where λ_o is the wavelength in vacuum of the incident light, n_i is the index of refraction of the layer material, θ_o is the angle of incidence, and f_i is the fraction of the nominal quarterwave thickness which is optimized to provide maximum reflectivity with the desired 90° phase shift.

4,312,571

METHOD FOR BONDING TO POLYMERIC CLAD OPTICAL WAVEGUIDES

Harry E. Ganzhorn, Stuttgart, Fed. Rep. of Germany, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 1, 1979, Ser. No. 90,111
Int. Cl.³ G02B 7/26
U.S. Cl. 350—320 **18 Claims**

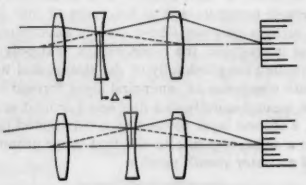
1. A method for preparing a polymeric clad fiber optic waveguide for bonding to a termination sleeve comprising the steps of removing cladding to expose a surface portion of the fiber core, the exposed portion having a polymeric residue thereon, and heating at least part of the exposed portion without the termination sleeve thereon to a sufficiently high temperature for a sufficient time so that a bond can be formed between the exposed fiber core and a termination sleeve substantially as strong as the bond that can be formed with a termination sleeve and a similar fiber core that has never been clad.

4,312,572

FOCUSING OBJECTIVE LENS SYSTEM FOR ENDOSCOPES

Nobuo Yamashita, Tama, and Miwako Maeda, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,639
Claims priority, application Japan, Dec. 29, 1978, 53-164039
Int. Cl.³ G02B 9/62
U.S. Cl. 350—423 **8 Claims**



1. An objective lens system for endoscopes comprising a first lens group having positive refractive power, a second lens group having negative refractive power and a third lens group having positive refractive power, and being so adapted as to effect focusing and changing of magnification level at the same time by displacing said second lens group along the optical axis, said objective lens system for endoscopes satisfying the following condition:

$$1<\beta_2<\beta'_2$$

wherein the reference symbol β_2 represents magnification level of said second lens group when the objective lens system is set for observing an object located at infinite distance and the reference β'_2 designates magnification level of said second lens group when the objective lens system is set for observing an object located at the shortest distance.

4,312,573

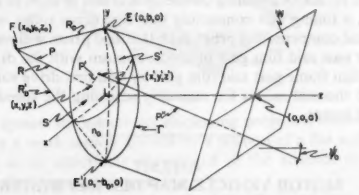
ELLIPTICIZED INFRARED LENS PROVIDING BALANCED ASTIGMATISM

Robert L. Sternberg, Noank, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 949,711, Oct. 10, 1978, Pat. No. 4,224,626. This application Apr. 9, 1980, Ser. No. 138,618

Int. Cl.³ G02B *3/04*

U.S. Cl. 350—432 **8 Claims**



1. An ellipticized singlet azimuth versus elevation optimized and aperture extremized nonspherical infrared lens with surfaces S and S' specified by the partial differential equations

$$S: \frac{\partial z}{\partial x} = F(A) \qquad \frac{\partial z}{\partial y} = G(A),$$

$$S': \frac{\partial(z',y')}{\partial(x,y)} = F'(A)\frac{\partial(x',y')}{\partial(x,y)}, \frac{\partial(x',z')}{\partial(x,y)} = G'(A)\frac{\partial(x',y')}{\partial(x,y)},$$

the symmetry conditions

$$z(-x,y) = z(x,y), \qquad z'(-x',y') = z'(x',y'),$$
$$z(x,-y) = z(x,y), \qquad z'(x',-y') = z'(x',y'),$$

and the boundary conditions

$$z(x,y)=z'(x,y)=0,$$

on the ellipse

$$\Gamma:(x^2/b_o^2\cos^2\psi_o)+(y^2/b_o^2)=1$$

where

S and S' are the lens surfaces having functional representations of the forms $z=z(x,y)$ and $z'=z'(x',y')$ wherein x' and y' and y' are themselves functions $x'=x'(x,y)$ and $y'=y'(x,y)$ of the independent variables x and y, $(\partial z/\partial x)$ and $(\partial z/\partial y)$ are the partial derivatives of z with respect to the independent variables x and y respectively, $(\partial(z',y')/\partial(x,y))$, $(\partial(x',y')/\partial(x,y))$ and $(\partial(x',z')/\partial(x,y))$ are the Jacobian of z' and y' with respect to the independent variables x and y, the Jacobian of x' and y' with respect to the independent variables x and y and the Jacobian of x' and z' with respect to the independent variables x and y respectively, F(A), G(A), F'(A) and G'(A) are the functions of the arguments $A=(x,y,z,x',y',z')$ defined as

$$F(A) = \frac{n_o(x'-x)p - xp'}{(z-z_o)p' - n_o(z'-z)p},$$

-continued

$$G(A) = \frac{n_o(y'-y)p - (y-y_o)p'}{(z-z_o)p' - n_o(z'-z)p},$$

$$F'(A) = \frac{n_o(x'-x)}{p'\cos\psi_o - n_o(z'-z)},$$

$$G'(A) = \frac{n_o(y'-y) + p'\sin\psi_o}{p'\cos\psi_o - n_o(z'-z)},$$

and where p and p' denote the path length elements defined by the expressions

$$p^2=x^2+(y-y_o)^2+(z-z_o)^2, p'^2=(x'-x)^2+(y'-y)^2+(z'-z)^2,$$

and n_o, y_o, z_o and ψ_o are respectively, the index of refraction of the lens material, the y and z coordinates of the finite focal point F and the off-axis angle to the infinite focal point F_∞, Γ is the ellipse bounding the lens formed by S and S' and is defined by the equation shown in which x and y are the independent variables and b_o is the maximum radius of the lens formed by S and S' and the semi-major axis of the ellipse Γ.

4,312,574

PHOTOTOPOMETER

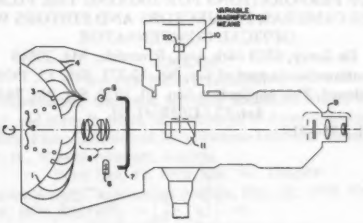
Karl-Heinz Wilms, Emmering, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 10,025

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1978, 2805084

Int. Cl.³ A61B *3/14, 3/10*

U.S. Cl. 351—7 **16 Claims**



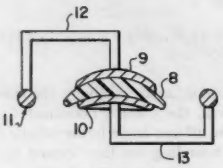
1. A phototopometer comprising a plurality of pairs of measuring targets arranged in a measuring target carrier for disposition at a predetermined distance from the cornea of an eye to be measured, and means for photographing the measuring targets reflected on the cornea to enable the radius of curvature of the cornea in the zone of the measuring target reflection to be determined from the reproduced image of the measuring targets in accordance with geometrical characteristics, the photographing means having an optical axis, the spacing of the measuring targets of each measuring target pair being dimensioned in dependence on the distance thereof to the optical axis of the photographing means and to the cornea, the plurality of measuring target pairs being positioned in the measuring target carrier radially outwardly from the optical axis, the measuring targets of respective measuring target pairs being arranged the same radial distance from the optical axis and on opposite sides of a common radius, whereby in accordance with the reproduction scale of the photographing means, the spacings of all reproduced measuring target pairs are in the same proportional relationship to the respectively associated radius of the cornea so as to enable a determination of the curvature of the cornea from the reproduced spacing of the measuring target pairs.

4,312,575

SOFT CORNEAL CONTACT LENS WITH TIGHTLY CROSS-LINKED POLYMER COATING AND METHOD OF MAKING SAME

Gholam A. Peyman, 1044 N. Oak Park Ave., Oak Park, Ill. 60302; Jeffrey E. Koziol, 249 Sunset, Palatine, Ill. 60067, and Hirotsugu Yasuda, Rte. 3, Box 98, Newburg, Mo. 65550

Filed Sep. 18, 1979, Ser. No. 76,794
Int. Cl.³ B05D *3/06*; G02C *7/04*
U.S. Cl. 351—160 H **20 Claims**



1. A soft corneal contact lens comprising a soft, highly oxygen-permeable, polymeric lens having formed on the surface thereof an ultrathin, optically clear, lipid-permeable hydrophilic barrier coating comprising the reaction product resulting from an electrical glow discharge polymerization process conducted in a gaseous atmosphere, said atmosphere consisting essentially of at least one compound selected from the group consisting of

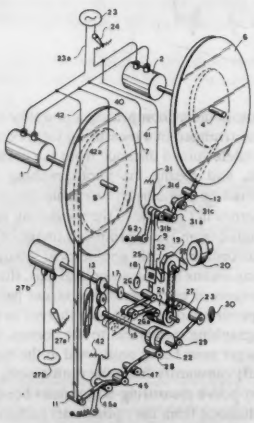
(a) hydrocarbons;
(b) halogenated hydrocarbons;
(c) halogenated hydrocarbons and hydrogen;
(d) hydrocarbons and an elemental halogen; and
(e) mixtures thereof.

4,312,576

DRIVING DEVICE FOR THE ELIMINATION OF THE USE OF PERFORATIONS FOR DRIVING THE FILM OF MOVIE CAMERAS, PROJECTORS AND EDITORS WITH OPTICAL COMPENSATOR

Viktor De Jeney, 6323 64th Ave., Riverdale, Md. 20840

Continuation-in-part of Ser. No. 12,373, Feb. 15, 1979, abandoned. This application Sep. 10, 1979, Ser. No. 74,068
Int. Cl.³ G03B *41/04*
U.S. Cl. 352—119 **1 Claim**



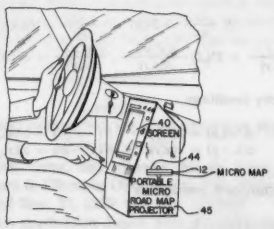
1. A motion picture apparatus comprising a supply reel and a take-up reel, a first reversible variable-speed gear-reduced motor for driving said supply reel, a second identical variable speed motor for driving said take-up reel, circuit means for connecting said first and second motors in series with a source of electric current for energizing said motors for rotation in the same direction and including variable means for controlling the speed of said motors, a film gate located along a film path between said supply reel and said take-up reel, a first sensing roller located between said supply reel and said film gate for sensing the tension in a film passing along said film path, a first rheostat connected in parallel circuit with said first motor, means connecting said first sensing roller with said first rheostat for varying the adjustment of said first rheostat in response to a variation in the tension sensed by said first sensing roller, a second rheostat connected in parallel circuit with said second motor, a second sensing roller located between said film gate and said take-up reel for sensing tension in said film, means connecting said second sensing roller to said second rheostat for varying the adjustment of said second rheostat in response to a variation in the tension sensed by said second sensing roller, first and second drive rollers located between said film gate and second sensing roller, the diameter of said drive rollers being an integral multiple of the height of one picture frame, a third variable speed motor for driving said first and second drive rollers at the same speed, a sound drum between said first and second drive rollers, an optical compensating prism rotatably mounted on the optical axis in front of said film gate, a timing belt connecting said first drive roller with said optical compensating prism such that said prism will rotate one facet past said film gate in synchronousm with the driving of one film frame past said film gate by said first drive roller, and third rheostat means for manually adjusting the speed of said third motor.

4,312,577

MOTOR VEHICLE MAP DISPLAY SYSTEM

J. Vincent Fitzgerald, 106 Norris Ave., Metuchen, N.J. 08840

Filed Aug. 13, 1979, Ser. No. 66,487
Int. Cl.³ G01C *22/02*; G03B *21/00*
U.S. Cl. 353—12 **26 Claims**



16. A map display system for a motor vehicle, comprising:

a slide holder for a slide having (i) a map portion comprising a projectable highway map and (ii) an index portion comprising a projectable list of locations and an optical coordinate position code corresponding to each location of said list;

coordinate control servomechanism means for positioning said slide holder in accordance with X-position and Y-position coordinate control signals;

optical map projection means for displaying on a first screen a magnified image of a selected part of the map portion of said slide;

optical index projection means mounted on said slide holder for displaying on a second screen a magnified image of at least one selected item of said list of locations;

index decoding means optically coupled to said index portion of said slide and responsive to said coordinate position code for generating X-position and Y-position coordinate designation signals cooresponding to said selected item;

an index register for storing said coordinate designation signals; and

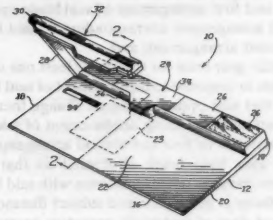
means coupled to said index register and operative in a location display mode of said system for generating said coordinate control signals to cause said slide holder to move to a position in which a location corresponding to said selected item of said list is displayed on said screen.

4,312,578

MICROFILM READER

Thomas R. Wells, Des Plaines, Ill., and John W. Overman, Phoenix, Ariz., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 25, 1980, Ser. No. 143,406
Int. Cl.³ G03B *21/24*
U.S. Cl. 353—79 **12 Claims**



12. A system for selectively displaying projected microfilm images at a work station defined by a portion of a flat surface adapted to be selectively illuminated in the absence of the display of said images comprising:

a supporting arm connected to the flat surface and extending vertically from the flat surface;

a hood supported by the supporting arm above the flat surface, the hood supporting a reflecting means and an illumination source adapted to be selectively energized for illuminating at least a portion of the flat surface;

a film housing assembly means including a projection lamp, lens, focusing means and film receiving and positioning means, the film housing means connected to the flat surface;

switch means to provide selective energization of the projection lamp and illumination source such that when the projection lamp is energized the illumination source is de-energized;

a substantially unenclosed optical image projection path extending from the film housing assembly, to the reflecting means, and to the common flat surface, whereby in one operator initiated mode of operation the illumination source is de-energized and a readable image is projected onto the flat surface without the need of an enclosure to exclude ambient light, and in another operator initiated mode of operation, the projection lamp is de-energized and the illumination source is energized to illuminate the flat surface.

4,312,579

MECHANISM TO CORRECT PROGRAMMED EXPOSURE VALUES IN ACCORDANCE WITH OBJECT CONDITIONS

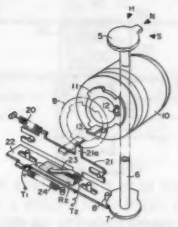
Yoshitaka Araki, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,163
Claims priority, application Japan, Jun. 21, 1979, 54-78541
Int. Cl.³ G03B *7/20*
U.S. Cl. 354—29 **3 Claims**

1. In a camera of the interchangeable lens type having a program exposure control device which is so programmed that a combination of shutter speed and aperture value may be determined according to the brightness of the object to be photographed and film speed and a lens mount; and an interchangeable lens detachably mounted on said body through said mount, the improvement comprising:

(a) program varying means provided in said program exposure control device, the program of said program exposure control device being capable of being arbitrarily selected by the setting of said program varying means;

(b) information means provided on said interchangeable lens, the information possessed by said information means corresponding to the main usage of photography of the lens;



(c) interlock means for setting said program varying means so that when said interchangeable lens is mounted on said body, said program varying means selects a program corresponding to the information possessed by said information means; and

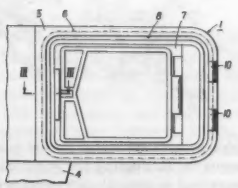
(d) manually operable correcting means on said camera for correcting said program varying means to vary the program of said program exposure control device.

4,312,580

WATERTIGHT HOUSING

Otto Schwomma, Gieshubl; Gerhard Raimann, Maria Enzersdorf, and Hans P. Breit, St. Polten, all of Austria, assignors to Eumig Elektrizitats- und Metallwaren-Industrie Gesellschaft m.b.H., Wiener Neudorf, Austria

Filed Dec. 17, 1979, Ser. No. 104,649
Claims priority, application Austria, Dec. 21, 1978, 9172/78; Feb. 6, 1979, 855/79
Int. Cl.³ G03B *17/08*; G08B *21/00*
U.S. Cl. 354—64 **25 Claims**



1. A watertight housing, preferably for photographic or cinematographical devices, which has a cover sealed against penetration of water, the cover being openable for access to at least one part that is important for putting a device arranged in the housing into operation, comprising

cover sealing means for sealing the cover,

a moisture detector being disposed—viewed from the outside—behind said cover sealing means,

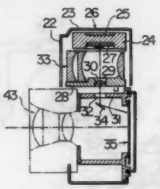
at least one evaluating device including a signal device being connected to said moisture detector.

4,312,581

FILM FRAME NUMBER DISPLAY FOR CAMERA

Fumihiro Miyagawa, Yokohama, and Akira Takahashi, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,678
Claims priority, application Japan, Jun. 26, 1979, 54-080313
Int. Cl.³ G03B 17/24, 17/36
U.S. Cl. 354—106 11 Claims



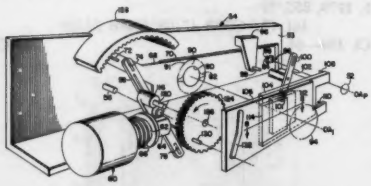
1. A display for a camera including an electronic clock, an electrooptical monitor display means for providing a digital representation of an output from the electronic clock, and optical entry display means for entering the digital representation provided by the electronic clock onto a film surface; characterized by a film number counter for counting a signal which is produced as the film is being fed, the count of the counter being applied to the monitor display means to indicate the frame number of the film; in which display the electronic clock, the entry display means and the monitor display means are assembled into a single modular element, the entry display means being disposed on the inner side of the modular element and the monitor display means being disposed on the outer side of the modular element.

4,312,582

EXPOSURE CONTROL AND FOCUSING APPARATUS FOR USE IN A PHOTOGRAPHIC CAMERA

Donato F. Pizzuti, Lynnfield, and Charles W. Triggs, Marshfield, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1981, Ser. No. 240,011
Int. Cl.³ G03B 13/02, 7/14, 15/03, 9/02
U.S. Cl. 354—196 16 Claims



1. Photographic camera apparatus for use in a camera of the type having means for facilitating the positioning of film in a plane for exposure and an optical path along which light from a scene can travel to expose the film, said apparatus comprising:

blade apparatus;

means for mounting said blade apparatus for displacement between a first arrangement in which said blade apparatus blocks scene light from traveling along the camera optical path thereby precluding scene light from reaching the film plane and a second arrangement in which said blade apparatus unblocks the camera light path, said blade apparatus being structured to define an aperture, aligned with the camera optical path, which varies in size in a predetermined manner during displacement of said blade apparatus between its first and second arrangements,

drive means actuable for displacing said blade apparatus between its first and second arrangements to define an exposure interval;

variable focus optical means structured to continuously focus scene light from a predetermined range of subject distances onto the film plane, said optical means comprising a pair of optical elements having refractive surfaces configured such that changes in focus are effected by displacing said elements relative to one another in a direction transverse to the optical axes of said elements;

means for mounting said optical refractive elements for movement relative to one another transverse to the camera optical path between a first arrangement corresponding to said first arrangement of said blade apparatus and a second arrangement corresponding to said blade apparatus second arrangement; and

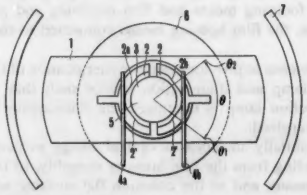
an epicyclic gear train for driving at least one of said optical elements in response to displacement of said blade apparatus so that said optical elements change focus in a predetermined manner during displacement of said blade apparatus between its first and second arrangements, said epicyclic gear train being structured so that said optical elements move in correspondence with said blade apparatus to focus at predetermined subject distances for predetermined sizes of said blade apparatus aperture.

4,312,583

ELECTROMAGNETICALLY DRIVEN SHUTTER DEVICE

Takehiko Ohniwa, Chichibu, and Yoji Sugiura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 217,038
Claims priority, application Japan, Dec. 19, 1979, 54-175840[U]
Int. Cl.³ G03B 9/08
U.S. Cl. 354—234 3 Claims



1. An electromagnetically driven shutter for opening and closing a photographing optical path in a camera, comprising:

(a) electromagnetic driving means including a shaft for driving shutter blades over a path of movement between a start position corresponding to a closed state and an end position corresponding to a totally open state, a permanent magnet and a conductor always arranged in the magnetic field of the permanent magnet wherein a selected one of the conductor and the permanent magnet is fixed on the shutter and the other one is mounted for rotational movement with the shaft, the magnetic field of the permanent magnet and the relative position of the conductor are such that either one of the conductor and the permanent magnet is rotated within a certain angle range about the axis of the shaft when current is supplied to the conductor along a certain direction;

(b) at least one shutter blade operatively engaged with the shaft of the electromagnetic driving means to open and close the photographing optical path;

(c) cam means mounted for rotational movement with the shaft of the electromagnetic driving means for providing a cam surface having a cam lift which varies relative to the

axis of the shaft in accordance with angular position about the axis of the shaft; and

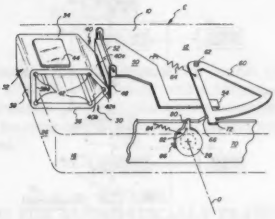
(d) slide contact means in elastic contact with the cam surface for holding the shaft of the electromagnetic driving means by friction wherein the cam lift of the cam surface is determined so that the magnitude of the friction is smaller in the region of the end position of the shutter blades.

4,312,584

SHUTTER ACTUATING MECHANISM FOR PHOTOGRAPHIC CAMERA

J. Kelly Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,311
Int. Cl.³ G03B 17/38
U.S. Cl. 354—266 2 Claims



1. In a camera having a substantially rectangular housing with top and bottom sides, end walls, and front and rear sides with apertures for accommodating the optical path of a viewfinder, a shutter actuating mechanism, comprising:

a compressible, open ended, box-like member having upper and lower platforms connected by one substantially rigid side wall, and one substantially flexible side wall, said substantially flexible side wall being adapted to buckle outwardly in response to pressure being applied to said upper and lower platforms;

means for securing said substantially rigid side wall of said box-like member to an end wall of said camera housing such that said upper and lower platforms are substantially coplanar with said top and bottom sides of said camera housing and are accessible through openings provided in the top and bottom sides of said camera, and such that said open ended box-like member surrounds the optical path of the viewfinder; and

shutter latch means disposed in the path of said outwardly buckling flexible side wall and adapted to receive a latch releasing force from said side wall in response to pressure being applied to said upper and lower platforms.

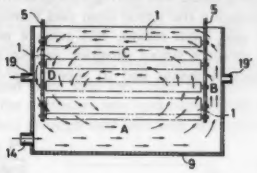
4,312,585

METHOD AND APPARATUS FOR TREATING GRAPHIC ARTS PROCESS PHOTOSENSITIVE MATERIALS

Takatoshi Otsu; Yasunobu Tanaka; Osamu Fukushima; Takeshi Mituhashi; Tadatune Mizuno; Toshiko Ogawa, and Kazuo Ichikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 10, 1979, Ser. No. 83,202
Claims priority, application Japan, Oct. 12, 1978, 53/125599
Int. Cl.³ G03D 3/02
U.S. Cl. 354—321 14 Claims

1. A method for treating a graphic arts process photosensitive material comprising the steps of: introducing a treating liquid through an inlet in a first vertical side wall of a treating bath, removing said treating liquid through an outlet in said vertical side wall, whereby said treating liquid is circulated in said treating bath, conveying said photosensitive material vertically with a U-turn in said treating bath in which said treating liquid is circulated, said photosensitive material being conveyed with the photosensitive layer facing outwardly, flowing said treating liquid along the photosensitive layer



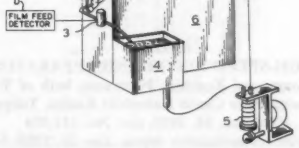
surface of said photosensitive material in a direction substantially perpendicular to the direction of movement of said photosensitive material.

4,312,586

METHOD AND APPARATUS FOR THE DEVELOPMENT OF FILMS IN A PHOTOGRAPHIC FILM PROCESSOR

Masami Ohtani, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 2, 1980, Ser. No. 155,089
Int. Cl.³ G03D 3/06
U.S. Cl. 354—321 5 Claims



1. In a method for the development of an exposed photographic film in an automatic film processor by passing the film through a developing tank containing a developer, the improvement comprising gradually varying the liquid level of the developer while feeding the said film into the developer in the developing tank for gradually increasing the time the film is immersed in the developer from the leading end toward the trailing end of the film.

4,312,587

IMAGE FORMING APPARATUS

Masao Ariga, Kawasaki; Hiroyuki Hattori, Inagi; Katsuichi Shimizu; Hirotoshi Kishi, both of Hoya; Hiroshi Ogawa, Kawasaki; Takahiko Amanuma, Tokyo; Kazumi Umezawa; Seiji Sagara, both of Kawasaki, and Kenji Kurita, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,614
Claims priority, application Japan, Mar. 2, 1977, 52-22981
Int. Cl.³ G03G 15/00, 15/28
U.S. Cl. 355—8 6 Claims

1. An image forming apparatus comprising:

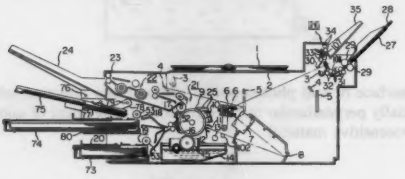
a plurality of operable means for forming an image on a recording member, said operable means comprising a scanning means for scanning an original to be copied;

manual selection means for selecting different modes for the scanning operation of said scanning means;

manual input means for instructing multiple copy operations; and

computer control means comprising memory means storing a plurality of programs corresponding to said scanning

modes for controlling the sequential operation of said operable means for the copying operation; storing a common program which is performed regardless of the selected scanning mode; and storing a program for receiving and discriminating the signal from said manual selection means and said input means, said control means being adapted to select a stored program in response to said manual selection means and to repeatedly control the



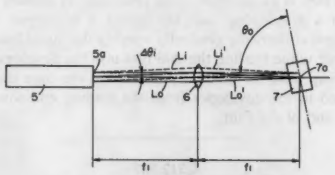
operation of said operable means in a sequence for the multiple copying operation under the selected scanning mode according to the program of the selected scanning mode, the common program and the instructions of the manual input means, and said control means being adapted to inhibit, in accordance with said memory means, the changing of said mode by operation of said selection means during the performance by the processing means of said multiple copying operations.

4,312,588

HIGH-SPEED RECORDING APPARATUS

Kazuo Minoura, and Kazuhiro Hirayama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,974
Claims priority, application Japan, Jan. 20, 1979, 54-5812
Int. Cl.³ G03G *15/28;* G03B *27/54*
U.S. Cl. 355—8 **5 Claims**



1. A high-speed scanning apparatus comprising:
a laser for emitting a light beam of a wavelength λ;
a modulator for converting the light beam from said laser into a plurality of independent modulated beams;
a plane to be scanned by said plurality of beams from said modulator; and
a converging optical system having a focal length f1 and positioned between said laser and said modulator, wherein the distance from the beam exit of said laser to said converging optical system is selected as $f1+\Delta S$ while the distance from said converging optical system to the modulating point of said modulator is selected as substantially equal to f1, and ΔS is selected to satisfy the following relation:

$$|\Delta S| < \pi \cdot Bi^2/4\lambda$$

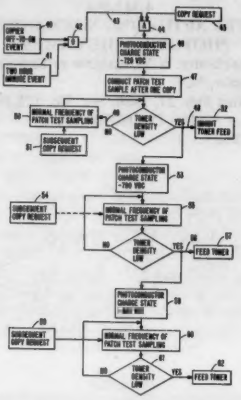
wherein Bi is the beam diameter.

4,312,589

CHARGE DENSITY CONTROL FOR AN ELECTROSTATIC COPIER

Robert C. Brannan, Boulder; Harvey R. Markham, Westminster, and Ben A. Nilsson, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,712
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 CH **10 Claims**



10. In a copier having a reusable photoconductor which is first charged to a working voltage and then developed by a carrier/toner mix to produce a visible image, wherein the copier exhibits a transient propensity to produce copies having more toner than normal thereon after the occurrence of a critical event, the improvement comprising:
first means operable to detect the occurrence of a critical event;
second means controlled by said first means and operable to alter the voltage magnitude of photoconductor charge in a direction to normally produce less toner in said visible image when a critical event is detected;
closed-loop control means controlled by said second means and operable to monitor the toner in said visible image during the interval of said transient propensity and to effect control of the magnitude of photoconductor charge back to said working voltage; and
further means operable to normally add toner to said mix as a result of operation of said closed-loop control means, said further means being controlled by said first means to be inoperative during at least a part of the interval of said transient propensity and to be operative thereafter.

4,312,590

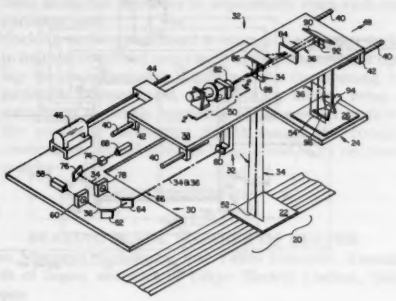
OPTICAL SCANNER AND SYSTEM FOR LASER BEAM EXPOSURE OF PHOTO SURFACES

Steven K. Harbaugh, Anaheim, Calif., assignor to Eocom Corporation, Irvine, Calif.

Continuation of Ser. No. 805,445, Jun. 10, 1977, abandoned. This application Sep. 13, 1978, Ser. No. 941,763
Int. Cl.³ G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **29 Claims**

1. In scanning apparatus for causing a laser beam to scan a line at an output plane in space: first mirror means forming a first planar reflective surface having a surface vector lying in a plane common to said beam, second mirror means forming a second planar reflective surface having its surface vector lying in the common plane, said first and second mirror means being disposed relative to ech other to form a reflective doublet about a line perpendicular to said common plane, a pyramidal mirror having a plurality of reflective segments inclined at an

acute angle relative to a plane perpendicular to the axis of the mirror, and means for rotating said mirror about its axis to move said segments successively through the path of the beam so that the beam is reflected from the segment in the path to the



doublet and back to the same segment for further reflection by that segment along an output path with a varying component of angular deviation perpendicular to the common plane and substantially no component of angular deviation parallel to the common plane.

4,312,591

APPARATUS FOR AUTOMATICALLY TRANSPORTING LIQUID SAMPLES TO AN ANALYZER

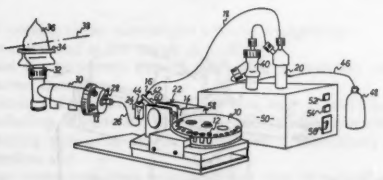
Toma Tomoff, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 8,226, Jan. 31, 1979, abandoned. This application Jul. 12, 1979, Ser. No. 56,751

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1978, 2805137

Int. Cl.[3] G01N *21/73*

U.S. Cl. 356—315 **13 Claims**



1. Apparatus for automatically transporting liquid samples from sample vessels to the burner of a flame atomic absorption spectrometer or a flame photometer, comprising:

a sample feed tube having an intake and dispensing end;

sample pump means coupled to said sample feed tube for taking in and dispensing a predetermined volume of a sample liquid through said intake and dispensing end of said sample feed tube;

a sample feeding vessel for receiving said sample liquid from said sample feed tube and communicating said sample liquid to said burner, said sample feeding vessel having an opening at an upper end thereof, an outlet at a lower end thereof, and an interior cavity in communication with said opening and said outlet, said cavity being substantially defined by a substantially annular convex surface;

means for moving said liquid sample feed tube between a first position with said intake and dispensing end thereof in communication with said sample feeding vessel and a second position in communication with a sample vessel;

pump means coupled to said sample feed tube for pumping a flushing liquid through said sample feed tube into said sample feeding vessel when said sample feed tube lies in said first position; and

control means coupled to said sample pump means, said flushing liquid pump means and said moving means for, in sequence, taking in a predetermined volume of sample liquid from the sample vessel when said feed tube lies in said second position, moving said feed tube from said second position to said first position, dispensing said sample liquid from said feed tube into said sample feeding vessel for discharge into said burner, and pumping flushing liquid through said feed tube into said sample feeding vessel.

4,312,592

METHOD AND DEVICE FOR THE MEASUREMENT OF LINEAR SPEEDS WITHOUT CONTACT AND WITHOUT MARKING

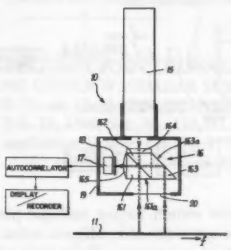
Jacques Sabater, Gif sur Yvettes, and Serge Bauduin, La Tronche, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Feb. 28, 1980, Ser. No. 125,313

Claims priority, application France, Feb. 28, 1979, 79 05165

Int. Cl.[3] G01P *3/36*

U.S. Cl. 356—28 **4 Claims**



1. An optical apparatus for continuously measuring the linear speed of relative travel between said measuring apparatus and a generally planar, elongated object of great length over a zone of travel in front of said apparatus, characterized by: a single source of laser radiation, an optical separator system for dividing a laser beam from said source to form two distinct beams, optical means for each beam for focussing the two beams at two zones (21,22) on said object (11) spaced in the direction of relative travel across a gap between the apparatus and the passing object and for returning a portion of radiation reflected from said zones onto a single optical detector, means for processing signals reflected from the two zones illuminated and received at the detector by the application of an autocorrelation function to the sum of the signals to determine the relative linear speed of the object, and means for displaying or recording the measured speed, wherein the axes of the focussed and reflected beams of the optical means are coincident.

4,312,593

DIRECT READOUT APPARATUS FOR MEASURING LIGHT TRANSMITTED THROUGH LIQUIDS

William B. Baker, Newark, Del., and Joe T. May, Fairfax, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1979, Ser. No. 106,252

Int. Cl.[3] G01J *3/50*

U.S. Cl. 356—414 **4 Claims**

1. An apparatus which measures light transmitted through a fluid sample by a photodetector and electronically converts a signal from the photodetector to a signal that is displayed on a readout device, wherein the apparatus contains a power

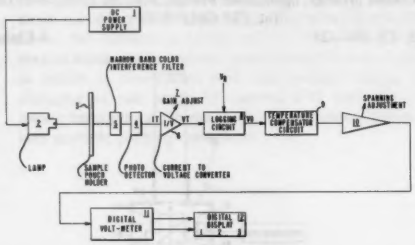
source, a light source connected to a power source, a photodetector, a sample holder for a fluid sample that forms a cell of a constant thickness through which light from the light source passes and is measured by the photodetector and a readout device; the improvement used therewith in the absence of a reference light beam comprises:

(a) a color interference filter positioned between the sample holder and the photodetector which filters all colors from the light transmitted through the sample except a band of colored light that is to be measured;

(b) a converter electrically connected to the photodetector which converts a current signal from the photodetector to a voltage signal;

(c) a logarithmic response circuit electrically connected to the converter that changes the voltage signal from the converter into a logarithmic signal proportional to the logarithm of the voltage signal;

(d) a digital voltmeter electrically connected to the logarithmic response circuit that converts the signal from the logarithmic response circuit to a signal displayed on the readout device;



(e) a selector switch having multiple positions each connected to a resister of a different value is positioned between the power source and the light source to provide a light source of varying intensity and the selector switch is mechanically coupled to a disc of multiple color interference filters such that the light source matches the color interference filter required for a particular light source;

(f) a gain adjustment is electrically connected to the converter which is a zeroing device that upon adjustment brings the readout device to a zero reading;

(g) a temperature compensator circuit is electrically connected to the logging circuit and the digital voltmeter in which the temperature compensator circuit adjusts the electrical signal received from the logging circuit to eliminate any variations in the signal caused by temperature variations; and

(h) a spanning adjustment circuit electrically connected to the temperature compensator circuit and the digital voltmeter to convert the electrical signal from the temperature compensator circuit into engineering units that can be displayed directly on the readout device.

4,312,594

BLENDING VESSEL AND METHOD OF BLENDING

Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,520
Int. Cl.³ B01F *15/02, 5/12*
U.S. Cl. 366—150 **5 Claims**

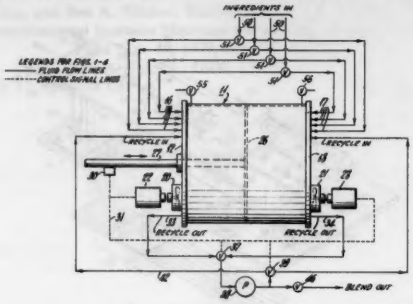
1. Cylindrical blending vessel for continuous mixing of a plurality of ingredients for producing a plurality of products in seriatim, comprising

plural first and second ingredient input means connected to said vessel,

first and second output means for said products,

means for variably dividing said vessel while maintaining said first input and output means separate from said second input and output means, comprising

a piston reciprocally movable in said vessel,



means for permitting movement of said piston from one extreme position to the other as one of said products is terminated and the next product is commenced, and

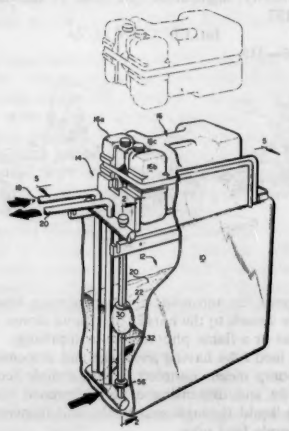
first and second mixing means associated with the ends of said vessel for mixing the products in the respective ends thereof.

4,312,595

AUTOMATIC FLUID MIXING SYSTEM AND A MULTI COMPARTMENTED CONTAINER THEREFORE

Kenneth O. Houseman, St. Charles, and Wolfgang O. Junkel, Mt. Prospect, both of Ill., assignors to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed May 5, 1978, Ser. No. 903,083
Int. Cl.³ B01F *15/04*
U.S. Cl. 366—153 **31 Claims**



1. An automatic fluid mixing system comprising:

a housing including means defining a reservoir and means for supporting a multi-compartmented container in a position which is displaced from an initial position in general proportion to the weight of the container;

inlet and outlet conduit means communicating with the reservoir for respectively permitting the ingress and egress of liquid;

liquid level sensing means for producing an enabling signal when the liquid level in the reservoir falls below a preselected level;

means responsive to the enabling signal for permitting a

quantity of base liquid to flow into the reservoir through the inlet conduit means; and

means responsive to the enabling signal for discontinuously opening the compartments of the container and including means having a contact surface and mounted for movement along the container to sequentially open each compartment, and

a blocking surface positioned to engage the contact surface to halt the continued movement of the compartment opening means immediately subsequent to the opening of a particular compartment, the blocking surface being dimensioned to enable bypassing of the contact surface as the container supporting means moves the container towards said initial position in response to its decreasing weight.

4,312,596

BEATING BLADE MEMBER OF BEATER

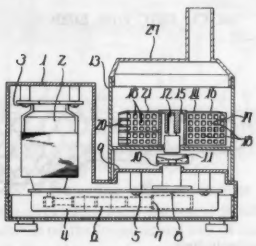
Kazuo Maezawa, Yokohama, and Yasuo Doumoto, Kawasaki, both of Japan, assignors to Tokyo Electric Limited, Tokyo, Japan

Filed May 15, 1979, Ser. No. 39,180

Claims priority, application Japan, May 24, 1978, 53-62012; May 24, 1978, 53-62013; May 24, 1978, 53-62014; May 24, 1978, 53-62015; May 24, 1978, 53-62016; May 24, 1978, 53-62017

Int. Cl.³ B01F *13/00*

U.S. Cl. 366—343 **4 Claims**



1. A beating blade member for a beater comprising:

a boss disposed at the center of a vessel;

means for rotatively driving said boss, operatively connected thereto;

a plurality of blades carried by said boss, each of said blades including a vertically stretched and radially extending beating surface in which are formed a multiplicity of meshes; and

flange means projecting from the upper edge of each of said blades toward the leading side as viewed in the direction of rotation, said flange means directing an upper portion of a material to be mixed in said vessel downward across the blades.

4,312,597

PRINTER

Munetaka Shimizu, Kawagoe, and Hiroyuki Harada, Kawaguchi, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

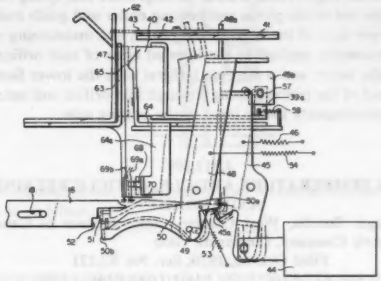
Filed Oct. 31, 1978, Ser. No. 956,360

Claims priority, application Japan, Nov. 6, 1977, 52/132926; Nov. 6, 1977, 52/132927; Nov. 6, 1977, 52/132928; Nov. 6, 1977, 52/132929; Nov. 6, 1977, 52/132930; Dec. 29, 1977, 52/176774[U]

Int. Cl.³ B41J *13/02*

U.S. Cl. 400—621 **3 Claims**

1. In a printer having a slide member adapted to be reciprocally moved by a drive source, the improvement comprises a paper cutting mechanism including a paper cutting member having a cutter blade for reciprocal movement relative to a printed paper for cutting said paper, a connection member supported on said paper cutting member and disposed to engage and disengage from said slide member and an electromagnetic means for controlling the engagement and disengagement of said connection member with respect to said slide member,



whereby when said electromagnetic means is operated in response to a paper cutting signal, said connection member is caused to engage said slide member to operate the slide member which in turn operates said paper cutting member.

4,312,598

HOUSEHOLD APPLIANCE FOR CLEANING FLOORS, WINDOWS AND OTHER WASHABLE SURFACES

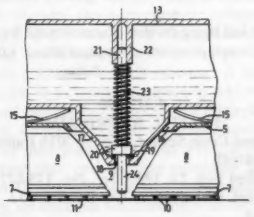
Lucienne Vagner, 29/33, rue Claude Tillier, 75012 Paris, France

Filed Feb. 11, 1980, Ser. No. 120,311

Claims priority, application France, Feb. 15, 1979, 79 03879

Int. Cl.³ A47L *1/00;* **A46B** *11/08;* **A47L** *13/32, 13/16*

U.S. Cl. 401—1 **11 Claims**



1. A household appliance for cleaning floors, windows and other washable surfaces comprising a handle, at one end of which is hinged a heating sole protected by a cover, said sole and said cover constituting an assembly hereinafter called the sole-cover assembly, in combination with a swab held under this heating sole, the word swab being understood in its widest sense and designating any absorbing substance made from textile, animal, vegetable or synthetic fibres, from paper or from any other material, as well as in combination with means for feeding water to the lower face of the heating sole in contact with the swab, these means comprising a water reservoir placed above said cover and at least one opening provided in the sole-cover assembly, in the direction of the swab, said reservoir comprising at least one appendage housed in said opening, said appendage having at its base at least one flow orifice for the water from the reservoir and means being provided for maintaining this orifice normally closed and for opening it when it is desired to damp the swab in contact with the heating sole, wherein said means for closing and opening the orifice of the appendage of the reservoir are return springs fixed to the upper face of said cover and by means of which the reservoir rests on the cover, so that said appendage of the reservoir extends into said opening of the sole-cover assembly

as far as the level of the heating sole; a piston disposed in the reservoir at right angles to said orifice and comprising a rod and a head, the upper end of the rod being slidingly mounted with an easy fit in a guide secured to a wall of the reservoir in the upper region thereof, whereas the head rests like a valve on an internal edge of said orifice; a compressed coil spring fitted over the rod of the piston and bearing under said guide and on the upper face of the head of the piston, and maintaining said head normally applied to the internal edge of said orifice to close the latter; and a stop pin integral with the lower face of the head of the piston passing through said orifice and extending approximately to the level of the heating sole.

4,312,599

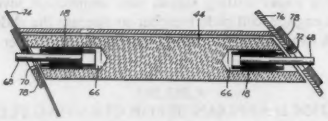
HIGH TEMPERATURE ARTICLE, ARTICLE RETAINER, AND CUSHION

Ramgopal Darolia, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 22, 1979, Ser. No. 87,121

Int. Cl.³ F16C *9/00*; F16D *1/00*; F16G *11/00*

U.S. Cl. 403—29 **9 Claims**



1. A high temperature cushion for a low ductility article comprising:

a flexible core comprising a resilient, fibrous, refractory material; and

a high temperature metal foil covering the core;

the foil having ductility sufficient to be formed about the core;

the core and foil being further characterized by the ability to withstand a temperature of at least about 1,000° F

4,312,600

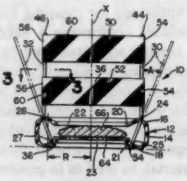
TRAFFIC BARRICADE

Cecil Schaaf, and Craig Schaaf, both of 3015 Palmer Rd., Standish, Mich. 48658

Filed Feb. 22, 1980, Ser. No. 123,527

Int. Cl.³ E01F *13/00*; B63B *21/52*

U.S. Cl. 404—6 **26 Claims**



1. A traffic marker comprising:

a relatively heavy base in the form of a horizontally disposed vehicle tire including upper and lower sidewall portions, said upper sidewall portion having a pair of aperture means therein located diametrically across from each other;

a pair of substanially vertical, flexible plastic tubular posts upstanding from said tire upper sidewall portion with the lower end portion of each post being received in one of said aperture means;

said pair of posts in their unflexed condition being substantially straight and upwardly diverging away from the principal axis of said tire in a substantially symmetrical manner;

a cross structural member having a pair of laterally spaced vertically extending tubular-like connector formations thereon, each said connector formation telescoped over a portion of an associated one of said posts such that said cross structural member extends between said posts above said base;

said cross structural member having a predetermined major dimension between its connector formations such that said member continually flexes the free upper end portions of said posts inwardly into substantial parallelism whereby said connector formations are frictionally retained on said posts; and

the arrangement being such that the lower end portions of said posts are bowed concavely inwardly whereby each said post lower end portion is urged into snug retention in its associated aperture means.

4,312,601

FASCINES

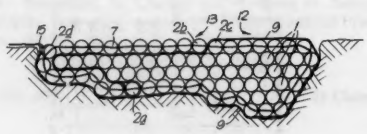
John M. Allen, Christchurch, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 20, 1980, Ser. No. 122,934

Claims priority, application United Kingdom, Feb. 26, 1980, 06700/79

Int. Cl.³ E01C *9/08*; E02B *3/12*

U.S. Cl. 404—35 **8 Claims**



1. A fascine including

a core comprising a multiplicity of cylindrical core members freely disposed in use in axially parallel relationship,

a sleeve disposed in use circumjacent the core, comprising a multiplicity of axially parallel cylindrical sleeve members transversely and continuously interconnected by at least two axially spaced flexible tie means disposed as continuous loops, and

an adjustable binding means attached to the sleeve for axially pleating the sleeve around the core.

4,312,602

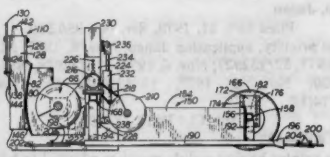
WET CONCRETE PAVEMENT SPREADING MACHINE AND REINFORCING ROD LAYER

Charles H. Dale, Rock Island, Ill., assignor to Pav-Saver Mfg. Co., East Moline, Ill.

Filed Nov. 19, 1979, Ser. No. 95,455

Int. Cl.³ E01C *23/04*

U.S. Cl. 404—100 **16 Claims**



7. A machine for spreading wet concrete pavement which comprises a frame, power-driven means supporting said frame

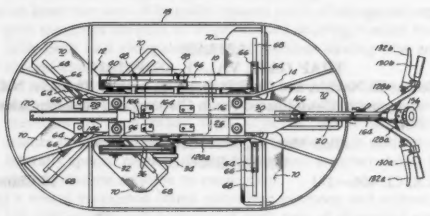
for movement along a subgrade for pavement, spreader means mounted on said frame for spreading wet concrete laterally over said subgrade as said machine moves forwardly along said subgrade, and plate means mounted on said machine and projecting forwardly therefrom and having a pair of side plates respectively extending forwardly from opposite sides of the machine and a cross plate extending transversely between respective forward portions of said side plates to define a three-sided enclosure into which wet concrete may be dumped to be spread by said spreader means.

4,312,603

TWIN TROWEL CEMENT FINISHING MACHINE

Marvin E. Whiteman, Jr., Eagle, Id., assignor to Whiteman Manufacturing Company, Boise, Id.

Filed Jun. 13, 1980, Ser. No. 159,404
Int. Cl.[3] E01C *19/22*
U.S. Cl. 404—112 18 Claims



1. A twin trowel cement finishing machine, comprising: an elongate frame structure;

a pair of sets of troweling blade assemblies supported by rotor shafts depending from the frame structure at spaced apart positions on the longitudinal axis of said frame structure, such that the circular troweling areas of the sets intersect and the blades of the sets are arranged to intermesh as they rotate;

means for rotating said sets of troweling blades in opposite directions; and

means for simultaneously tilting the axes of rotation of said shafts in opposite directions from neutral positions in a generally vertical plane containing the longitudinal frame axis, to selectively generate blade reactive forces for propelling the machine in opposite directions along a path of movement extending generally at right angles to the longitudinal axis of said frame structure.

4,312,604

FRICTION ROCK STABILIZER SET, AND A METHOD OF FIXING A FRICTION ROCK STABILIZER IN AN EARTH STRUCTURE BORE

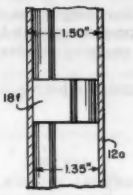
Chuen-Cheng Fu, North Brunswick, and Satya P. Arya, Somerville, both of N.J., assignors to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Jul. 17, 1980, Ser. No. 169,817
Int. Cl.[3] E21D *21/00, 20/00*
U.S. Cl. 405—259 15 Claims

1. A method of fixing a hollow body, friction rock stabilizer, having a substantially uniform inside diameter, in an earth structure bore of a given transverse dimension, comprising the steps of:

inserting a friction rock stabilizer in an earth structure bore; and

expanding the inserted stabilizer, into fast, frictional engagement with the bore surface, by forcing an insert internally and lengthwise of the stabilizer; wherein



said expanding step comprises forcing a contractible insert into the stabilizer.

4,312,605

METHOD FOR GROUTING JOINTS AND/OR CRACKS IN SEWER CONDUITS

William J. Clarke, Ridgewood, N.J., assignor to Hayward Baker Company, O'Denton, Md.

Filed Mar. 24, 1980, Ser. No. 133,361
Int. Cl.[3] E02D *3/12, 29/10;* E21B *33/138*
U.S. Cl. 405—264 4 Claims

1. In a method of grouting joints or cracks of sewer conduits with the type of conventional equipment having a mixing packer unit movable within the conduit in succession from one point or zone of grouting to one or more others spaced along the conduit wherein the two components A and B of a two-part grouting composition are separately and simultaneously fed to the packer unit and rapidly form a grouting gel polymer upon mixing at the grouting zone and shorty after the grouting of one zone, the packer is moved to the next point needing grouting, and the moving and grouting is repeated to grout the leaky points therein, the improvement wherein the components A and B of the two part grouting composition that are fed separately and simultaneously to the packer unit at each grouting zone are the following: one part A being an aqueous 20 to 40 weight % monomer solution in which the monomers therein consist essentially of magnesium diacrylate, alkali metal acrylate, and covalent polyethylenically unsaturated monomer, the latter monomer being from 3 to 5% by weight of the sum of the diacrylate and acrylate monomer, part A also containing about 1 to 15% by weight of triethanolamine, the other part B being an aqueous solution of 1 to 20% by weight of ammonium persulfate; the proportion of ammonium persulfate in part B, the proportion of triethanolamine in part A, and the relative porportions of parts A and B that are fed to the packer and mixed on simultaneous discharge therefrom to the leaky joint or crack in the surrounding wall of the conduit being preselected in correlation to the temperature at the grouting zone to result in the formation of a polymer gel within a gel time of about 10 to about 40 seconds.

4,312,606

INTERLOCKING PREFABRICATED RETAINING WALL SYSTEM

Simsek Sarikelle, 133 Scenic View, Copley, Ohio 44321

Filed Mar. 21, 1980, Ser. No. 132,630
Int. Cl.[3] E02D *29/02*
U.S. Cl. 405—286 10 Claims

1. A prefabricated retaining wall system for constraining soils of various types comprising:

(a) a plurality of tie bar components of slab like configuration having a rectangular cross section, upper and lower planar surfaces for horizontal engagement with lower and upper surfaces of tie bar components situated below and above, a front planar surface to produce, in conjunction with other front surfaces, a front face of the retaining wall, a rear planar surface to constrain the soil therebehind,

longitudinal ends having notches centrally positioned therein, semicircular projections extending rearwardly at each end tangential to said ends containing apertures therethrough,

(b) a plurality of filler components of the same cross section as said tie bar components, with longitudinal ends having projections for engaging notches in said tie bar components,

(c) a first horizontal tier having in alternating placement

upon the earth tie bar components and filler components with notches and projections in fixed engagement, a second tier of similar alternating arrangement of components placed upon said first tier, third and additional tiers to result in the retaining wall front face having a height required by the soil to be constrained, and

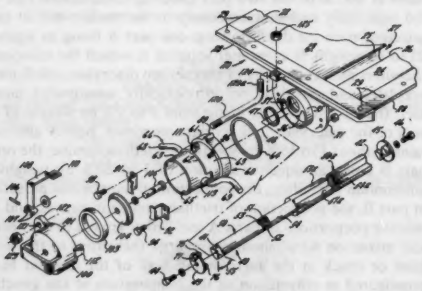
(d) a plurality of post components disposed through said apertures to secure the tier bar components and filler components to the earth below creating a unitized structure.

4,312,607

PELLET GATE FOR PNEUMATIC DISCHARGE HOPPER CAR

Charles L. Van Auken, New Cumberland, Pa., assignor to Keystone Industries, Inc., Rolling Meadows, Ill.

Filed Jan. 18, 1980, Ser. No. 113,374
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—128 **9 Claims**



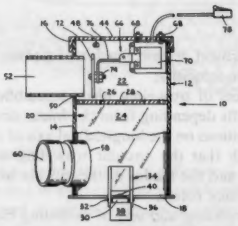
1. A pellet valve assembly for a pneumatic discharge hopper car comprising, in combination, a hopper outlet having end walls and inclined side walls, the latter terminating in relatively sharp opposed edges spaced parallel to one another in the width dimension of the car to form a valve gap, a semi-cylindrical trough below the valve gap having its upper edges joined to the inclined side walls and extending the length thereof between the end walls and terminating in a cylindrical neck located at one of the end walls, a valve rod of circular profile having ends and centered in, and substantially filling, the valve gap and having an axis which is spaced above the axis of the neck, the rod having oppositely facing longitudinal grooves defining a figure-eight cross section and mounted for rotation from a valve-closed position in which the valve rod sealingly bridges the opposed edges of the hopper side walls and a valve-open position in which the grooves in the rod face the opposed edges of the hopper side walls for passage of the pellets, a cylindrical control collar having an inner wall and mating with the neck on the trough to provide a coaxial swivel connection therewith, the control collar having a pneumatic outlet tube at its outwardly presented and, a handle on the control collar for rockably positioning the same, and a geared connection including teeth interposed between the inner wall of the control collar and the adjacent end of the valve rod so that limited rocking movement of the control collar is effective to rotate the valve rod between valve-open and valve-closed conditions, (a) the valve rod terminating substantially at the neck of the trough, (b) the teeth forming the geared connection being axially separable, and (c) the neck being axially short so that when the control collar is axially disengaged from the neck of the trough the geared connection is automatically uncoupled and to provide easy and direct access for a probing tool angled upwardly into the gap.

4,312,608

TRAP GATE VALVE ASSEMBLY

George D. Nakhle, and Cecil R. Bell, Jr., both of Pinnacle, N.C., assignors to Consolidated Foods Corporation, Winston-Salem, N.C.

Filed Mar. 10, 1980, Ser. No. 128,927
Int. Cl.³ B65G *53/60*
U.S. Cl. 406—171 **10 Claims**



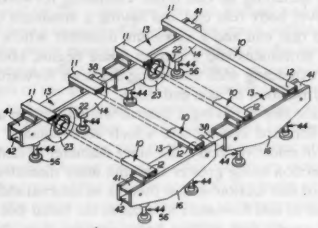
1. A trap gate valve assembly for pneumatically transferring work articles from a work processing machine to a receiving apparatus comprising a housing defining a cylindrical chamber, said housing including a generally vertically disposed annular side wall, a removable upper end wall closing one end of the cylindrical chamber and lower end wall closing the end of the chamber opposite said one end, means releasably coupling said upper end wall to said annular side wall, means for pivotably supporting said lower end wall relative to said annular wall and for normally retaining said lower end wall in abutting relation with said annular side wall to close said chamber, perforated wall means within said housing and extending transversely of said chamber for dividing said chamber into first and second compartments, first duct means defining a first port in said annular side wall for permitting the transfer of work articles from a work processing machine into said first compartment, second duct means defining a second port in said annular side wall for providing communication between said second compartment and a vacuum source, closure means completely encompassed within said second compartment and cooperating with said second duct means for selectively opening said second port to control the flow of air through said chamber to transfer a work article to said first compartment, and for closing said second port to interrupt air flow thus discharging the article from said first compartment to a receiving apparatus.

4,312,609

MINE ROOF SUPPORT SYSTEM

Donnell H. Culley, Jr., P.O. Box 118, Whitesburg, Tenn. 37891

Filed Jul. 1, 1980, Ser. No. 165,203
Int. Cl.[3] E21D *15/00*
U.S. Cl. 405—291 15 Claims



1. A mine roof support system comprising,

(a) at least two sets of laterally spaced pairs of elongated support members adapted to be positioned abutting a mine roof with each said elongated support member having first and second end portions,

(b) a wheel supported frame extending between and connecting said first end portions of each pair of elongated support members to each other with adjacent wheel supported frames connecting said first end portions of each said set of laterally spaced pairs of elongated support members being in spaced tandem relation to each other,

(c) a wheel supported frame extending between and connecting said second end portions of each pair of elongated support members to each other with adjacent wheel supported frames connecting said second end portions of each said set of laterally spaced pairs of elongated support members being in spaced tandem relation to each other,

(d) connector means extending between and operatively connecting in spaced relationship said adjacent wheel supported frames which connect said first end portions and said adjacent wheel supported frames which connect said second end portions so that said sets of laterally spaced pairs of elongated support members are adapted to move as a unit, and

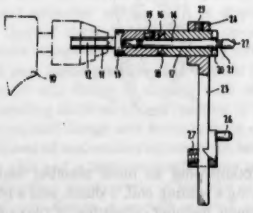
(e) extensible prop means for raising and lowering said wheel supported frames so that the pairs of elongated support members connected thereto are moved into and out of engagement with the mine roof.

4,312,610

SHEET MATERIAL CUTTING DEVICE

Arthur D. Burt, Watsonia, Australia, assignor to McPherson's Limited, Melbourne, Australia

Filed Jul. 13, 1979, Ser. No. 57,356
Claims priority, application Australia, Jul. 21, 1978, PD5166; Mar. 15, 1979, PD8037
Int. Cl.[3] B23B *45/16;* B23D *27/02*
U.S. Cl. 408—26 19 Claims



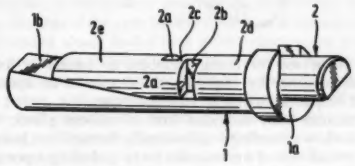
1. A device for cutting sheet material comprising: a cutter having rotatable hole cutting means at one end thereof for creating an initial opening in said sheet material and a cutting edge transverse to the axis of rotation of said hole cutting means, said transverse cutting edge being arranged axially spaced from said hole cutting means; and said device further including an element cooperable with said transverse cutting edge, said element and said transverse cutting edge being relatively reciprocable whereby, in use, said transverse cutting edge engages with an edge of said sheet material to remove material therefrom.

4,312,611

FASTENING ELEMENT ASSEMBLY WITH A SPREADING WEDGE

Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Apr. 26, 1980, Ser. No. 133,985
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913090
Int. Cl.[3] F16B *13/04, 13/08*
U.S. Cl. 411—9 9 Claims



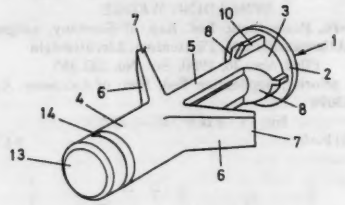
1. An axially elongated fastening element assembly arranged to be inserted into a borehole, said fastening element assembly comprising an axially elongated anchoring bolt and an axially elongated spreading wedge, said spreading wedge being displaceable in the axial direction relative to said anchoring bolt between a first position where the fastening element assembly can be removably inserted into a borehole and a second position where said spreading wedge is displaced axially relative to said anchoring bolt for securing said anchoring bolt within the borehole, said anchoring bolt and spreading wedge each having a leading end which is inserted first into the borehole and a trailing end spaced in the axial direction from the leading end, means on the trailing end of said anchoring bolt for applying a load thereto, said anchoring bolt and spreading wedge combining to form an axially extending cylindrically shaped outer surface of the fastening element assembly with each forming a portion of the cylindrically shaped outer surface, said anchoring bolt having a first wedge surface extending from the leading end thereof toward the trailing end for a portion of the axial length thereof and with the transverse cross-sectional area of said anchoring bolt for the axial length of said first wedge surface decreasing from the leading end toward the trailing end thereof, said spreading wedge having a second wedge surface extending from the leading end thereof for a portion of the axial length thereof with said second wedge surface extending angularly relative to the axis of said cylindrically shaped outer surface and being formed complementary to the first wedge surface of said anchoring bolt so that the transverse cross-sectional area of said spreading wedge for the length of said second wedge surface increases in the direction toward the trailing end thereof, said first and second wedge surfaces being in contacting relation so that the outer surfaces of said anchoring bolt and spreading wedge in the first position form the continuous cylindrically shaped outer surface of the fastening element assembly, wherein said spreading wedge intermediate and spaced from the leading and trailing ends thereof is shaped to provide a separating web joining axially extending parts of said spreading wedge with said separating web forming a predetermined breaking point so that when the predetermined breaking point is reached said separating web fractures and permits said part of said spreading wedge extend-

ing from said separating web toward the trailing end thereof to move axially toward the leading end of said anchoring bolt relative to said part of said spreading wedge extending from said separating web toward the leading end thereof.

4,312,612
SCREW FIXING DEVICE

Bruce R. Thompson, Tranmere, Australia, assignor to United Packages Limited, Queensland, Australia

Filed May 31, 1979, Ser. No. 44,318
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—15 **7 Claims**



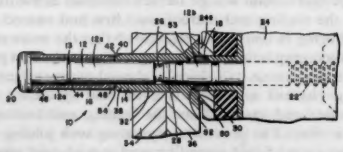
1. A device for fixing members to panels or for joining panels together by engaging the device in an aperture in a panel or panels, which device comprises:

a tubular body moulded from a resilient plastic having a hollow extending longitudinally through it, a head portion at one end of said tubular body including a portion of an external dimension larger than the said tubular body, a tail portion on said tubular body co-extensive with said body but spaced from said head portion, connectors peripherally spaced apart around the said tubular body co-extensive with the said tail portion and integral to said head portion whereby to form longitudinal spaces adjacent the said connectors between the said head portion and tail portion, and wings in the said spaces formed integral with the said tail portion projecting toward but not attached to the said head portion and of a length to be accommodated in the said spaces but moulded to have the said wings project angularly outward but displaceable inwardly into the said spaces when the device is inserted through an aperture, said hollow in the said head portion being of a cross-sectional dimension to freely engage a fixing screw, but of a cross-sectional dimension in the said tail portion to engage the said screw to cause the said tail portion to be drawn towards the said head portion when the screw is appropriately rotated whereby the said connectors bulge outward to expand the cross-sectional dimension of the said device at the locality of the connectors.

4,312,613
BLIND RIVET ASSEMBLY

Lloyd S. Binns, 10220 Warner Ave., Apt. E, Fountain Valley, Calif. 92708

Continuation-in-part of Ser. No. 37,635, May 11, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 204,170
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—34 **20 Claims**



1. A blind rivet assembly of the type having a mandrel with an enlarged head at one end, and having a rivet body and a separate buckle forming sleeve disposable about said mandrel with the rear end of said buckle sleeve against said enlarged head and the forward end of said buckle sleeve abutting against the rear end of said rivet body, said assembly being useful for fastening a workpiece from one side thereof, the improvement wherein:

the rear end of said rivet body has a double domed configuration including an end dome extending forwardly from said rivet body rear end and having a minimum diameter at said rear end and a maximum diameter where the end dome terminates and a second dome begins, said second dome extending with increasing diameter forwardly from the termination of said end dome,

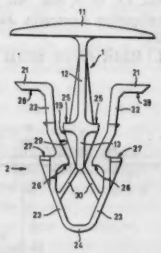
said buckle sleeve having a central walled section and having a forward end section which abuts against the end dome of said rivet body, the inner diameter of said central wall section being greater than the inner diameter of said forward end section so that there is an internal shoulder at the rear of said forward end section, the radial thickness of said forward end section being greater than the radial thickness of said central walled section,

the length of said rivet body being greater than the thickness of said workpiece, so that during installation, as said mandrel is translated forwardly while counterforce is exerted axially rearwardly on said rivet body, said buckle sleeve will begin to buckle while said forward end section is still abutting against said rivet body first dome, said buckle initially forming in the vicinity of said internal shoulder, continued mandrel translation causing said buckle sleeve to slide over said end dome into abuttment with said second dome, the increased resistance of said second dome to forward movement of said buckle sleeve resulting in continued buckle formation as said mandrel is translated further forward, so that said buckle is substantially completely formed against said second dome, further continued forward translation of said mandrel causing said substantially fully formed buckle to expand over said second dome and to translate axially along the exterior of said rivet body into firm abutting relationship with said workpiece.

4,312,614
SECURITY FASTENER

John P. Palmer, Reading; Alfred E. C. Piper, and Richard J. Harris, both of Basingstoke, all of England, assignors to ITW Limited, Windsor, England

Filed Nov. 19, 1979, Ser. No. 95,826
Claims priority, application United Kingdom, Nov. 21, 1978, 45511/78
Int. Cl.³ A44B *17/00*; F16B *13/04*
U.S. Cl. 411—44 **12 Claims**



1. A fastener comprising an inner member and an outer member each having a leading end, a shank, and a trailing end, the shank of the outer member consisting of two substantially parallel legs defining between them an open-sided passage which contracts towards the leading end, and the leading end

of the outer member consisting of two limbs, which define between them an open-sided space and converge to a tip where they are interconnected, and which are each connected to a respective leg and present an external shoulder facing away from the tip and an internal shoulder facing towards the tip, and the trailing end of the outer member including outwardly extending portions presenting an external shoulder facing the leading end of the outer member, the leading end of the inner member being capable of fitting in the space within the leading end of the outer member, with shoulders on the inner member co-operating with the internal shoulders on the outer member, the length of the shank of the inner member being such that the trailing end of the inner member is positioned adjacent the trailing end of the outer member when the leading end of the inner member is within that of the outer member, the inner and outer members being joined by flexible straps extending from the leading end of the inner member to the limbs of the leading end of the outer member, the two members and the straps being an integral moulding of plastics material.

4,312,615

FASTENING UNIT INCLUDING AN ANCHORING MEMBER AND A SPREADER WEDGE

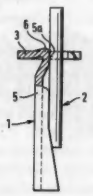
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 28, 1980, Ser. No. 153,862

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922567

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—78 **11 Claims**



1. Fastening unit comprising an axially elongated anchoring member and an axially elongated spreader wedge, each of said anchoring member and spreader wedge having a first end and a second end spaced apart in the axial direction thereof, said spreader wedge being slidably displaceable in contact with said anchoring member, said anchoring member comprising an axially elongated shank part extending between the first and second ends thereof and a flange secured to and extending transversely outwardly from the first end of said shank part, said flange having an opening therethrough, said spreader wedge being positionable through the opening in said flange, the opening in said flange having surfaces for guiding said spreader wedge, said shank part having at least one axially extending surface aligned with the opening in said flange for combining with the surfaces in the opening of said flange for guiding said spreader wedge as it is displaced in the axial direction thereof through said flange opening, wherein the improvement comprises that said axially extending surface of said shank part guiding said wedge outside the axially extending region of said flange is aligned with at least part of the axially extending surfaces of said opening in the axially extending region of said flange and extends from said flange toward the second end of said anchoring member, said flange is formed integrally with and is bent outwardly from said shank part into a plane extending transversely of the axis of said shank part, a portion of said flange is arched relative to the transversely extending plane and projects from the transversely extending plane in the opposite direction from the second end of said anchoring member.

4,312,616

CHIP CATCHING WASHERS

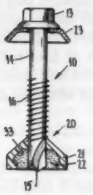
Campbell E. Waller, Eltham, and Keith E. Watts, Brunswick, both of Australia, assignors to McPherson's Limited, Melbourne, Australia

Filed Aug. 16, 1979, Ser. No. 67,206

Claims priority, application Australia, Aug. 16, 1978, PD5519; Dec. 4, 1978, PD6990; Jul. 11, 1979, PD9537

Int. Cl.³ F16B *25/00, 43/00*

U.S. Cl. 411—387 **13 Claims**



1. A washer of elastomeric material adapted for use with a fastening element of the type having a head, an at least partially screw threaded shank and a drill point wherein the washer includes means for forming a seal between the head of the fastening element and a surface through which the fastening element passes, said washer including a bore arranged to receive the drill point of the fastening element, a skirt portion surrounding and extending generally axially of said bore and defining a cavity contiguous with said bore of sufficient volume to contain particles as they are produced during the drilling phase of operation of the fastening element formed on said surface through which the fastening element passes, said cavity being adjacent to and annularly spaced from the axis of said bore, and location means for positioning the washer relative to said drill point whereby in use at least a part of said skirt portion surrounding the drill point is held against said surface to prevent escape of said particles produced during the drilling phase of operation of the fastening element with said particles being received and retained in said cavity, and means associated with said cavity for retaining the particles therein.

4,312,617

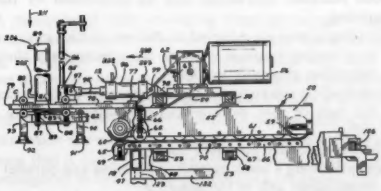
CASE BLANK VACUUM PICKUP AND FEEDER APPARATUS

Ralph H. Livingston, Excelsior, and Philip G. Rawlins, Minneapolis, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Jul. 5, 1979, Ser. No. 54,693

Int. Cl.³ B65H *3/08*

U.S. Cl. 414—121 **15 Claims**



1. For removing a case blank having an upper and a lower surface from a stack of case blanks in flat folded conditions and advancing a case blank, a main frame, longitudinally elongated slide means mounted on the main frame for supporting a flat folded case blank as it is advanced, first carriage means mounted on the main frame for reciprocal movement between a first position and a second position longitudinally forward of the first position for advancing a case blank along the slide

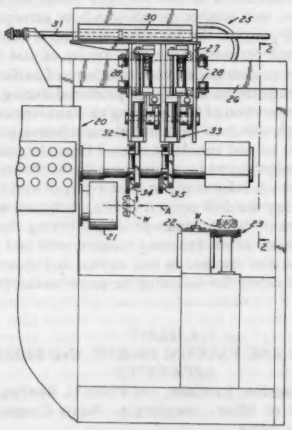
means, conveyor means on the frame for advancing a flat folded case blank from a transfer position and discharging the case blank onto the slide means in a position to be advanced along the slide means by movement of the first carriage means from its first position to its second position, and a vacuum pickup assembly mounted on the main frame for removing a case blank from the stack of case blanks and moving the case blank to the transfer position to transfer the picked up case blank to the conveyor means, the conveyor means including a continuous belt having a longitudinally elongated inner run for conveyingly abutting against one of said surfaces, a conveyor frame, means mounted on the conveyor frame for mounting and driving the belt, and longitudinally spaced means for abutting against the other of said surfaces of the blank abutting against the inner run, the belt inner run being at a higher elevation than the means for abutting against the other of said surfaces.

4,312,618

LOADER-UNLOADER SYSTEM FOR WORK PIECES

Larry D. Greene, Centralia, Ill., assignor to Acco Industries Inc., Bridgeport, Conn.

Filed Aug. 21, 1979, Ser. No. 68,411
Int. Cl.³ B65G *57/20*
U.S. Cl. 414—225 **10 Claims**



1. A loader-unloader system for loading and unloading work pieces, particularly work pieces having thin portions, in a machine tool wherein each work piece is held in position for rotation about a longitudinal axis by a chuck during which various machine operations may be performed by the tool comprising

a loading conveyor adapted to deliver articles in succession to a loading position wherein the articles have their axes extending generally vertically,

an unloading conveyor adapted to receive work pieces with the axes of said work pieces extending generally vertically,

a loader-unloader assembly comprising

means defining a track extending along an axis parallel to the longitudinal axis of the machine,

a trolley movable along said track means,

means for moving said trolley back and forth along said track means,

a load-vacuum clamping head assembly mounted on said trolley,

an unload-vacuum head assembly mounted on said trolley,

each said assembly including a vacuum head for gripping a work piece,

said loading conveyor and said unloading conveyor being positioned in side-by-side relation and extending transversely to the longitudinal axis of said machine,

said vacuum head of said load-vacuum head assembly having a configuration for gripping a work piece which is to be machined,

said vacuum head of said unload-vacuum head assembly having a configuration for gripping a work piece which has been machined,

and means on said trolley for mounting said vacuum head of each said assembly for swinging movement into and out of position adjacent said chuck and for reciprocating movement toward and away from the axis of said chuck,

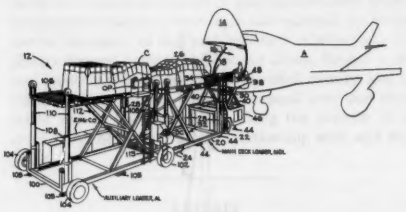
and means for swinging said vacuum head of each said assembly from a position wherein said work piece has its axis extending parallel to the axis of the machine to a position wherein the axis of the work piece is at an acute angle to the axis of the machine and extending generally vertically and overlying its respective conveyor.

4,312,619

AIRCRAFT CARGO LOADING METHOD AND APPARATUS

James M. Anderson; Richard O. Hassel, both of San Jose; Donald M. Inghram, Santa Clara, and Edwin Winkler, Santa Cruz, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jul. 19, 1979, Ser. No. 58,895
Int. Cl.³ B65G *67/00*
U.S. Cl. 414—347 **19 Claims**



1. Apparatus for transferring both large and small containers into and out of aircraft comprising; means defining a mobile main loader movable into position adjacent an aircraft, said main loader means including means defining a vertically movable main container supporting platform for changing the elevation of and for transferring containers between the aircraft and airport cargo handling facilities by moving the containers relative to said main platform, means defining a mobile auxiliary loader movable adjacent said main loader, said auxiliary loader means including means defining a vertically movable container supporting auxiliary platform which cooperates with said main loader platform for supporting and changing the elevation of a container too large to be supported by either loader alone and for transferring the large container between the aircraft and the airport cargo handling facilities by moving said large container relative to said main and auxiliary platforms, and selectively operable locking means for mechanically locking said two platforms together and in horizontal alignment when changing the elevation of a large container supported on both platforms.

4,312,620

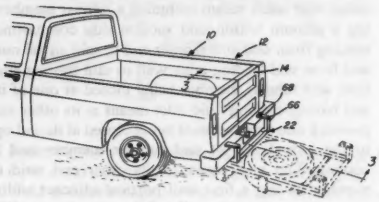
SPARE TIRE RACK

Ben E. Muschalek, Jr., Box 198, McCamey, Tex. 79752

Filed Nov. 6, 1979, Ser. No. 91,744
Int. Cl.³ B62D *43/04*
U.S. Cl. 414—466 **7 Claims**

1. In combination with a vehicle including a marginal portion beneath which a spare tire wheel may be supported in generally horizontal position and including frame structure

inwardly of said marginal portion and a structural member adjacent the outer margin of said marginal portion, a spare wheel rack assembly including an elongated guide structure having one end pivotally anchored to said frame structure for angular displacement relative thereto about a horizontal axis extending transversely of said guide structure between a first raised horizontal position and a second lowered position with the other end of said guide structure lowered relative to said one end, an elongated wheel supporting rack, support means pivotally supporting one end of said rack from said guide structure for angular displacement relative thereto about an axis transverse to said guide structure and said rack and movement of said axis along said guide structure between a first position with said rack one end closely adjacent said one end of said guide structure and the other end of said wheel supporting rack adjacent said other end of said guide structure and a



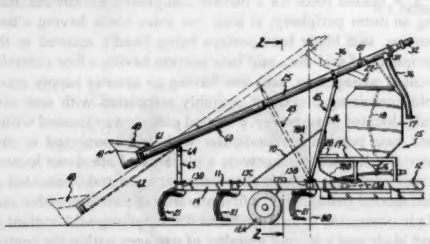
second position with said rack one end adjacent said other end of said guide structure and said rack other end displaced endwise outwardly of said guide structure other end, said other ends of said guide structure and rack including coacting releasably engagable means operative to supportingly engage the other end of said guide structure from said other end of said rack against relative vertical shifting of said other ends upon final movement of said rack from its second position to its first position and disengageable upon initial movement of said rack to its second position, said other end of said rack and said marginal portion including coacting latching structure releasably engageable with each other when said rack and guide structures are in their first positions, and pivot limiting means operatively connected between said structural member and said other end of said guide structure limiting downwardly swinging movement of said other end of said guide structure relative to said structural member.

4,312,621

AUGER FOR FILLING SEEDER ON TOOL BAR CARRIER

Sherman H. Quanbeck, Aneta; Albert O. Ringdahl, and David P. Desautels, both of McVille, all of N. Dak., assignors to Wil-Rich, Inc., Wahpeton, N. Dak.

Filed Dec. 7, 1979, Ser. No. 101,277
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—523 **7 Claims**



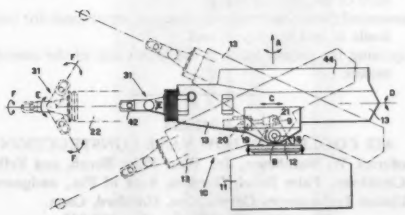
1. For use in connection with an agricultural implement having a frame with peripheral edges and having storage tanks for particulate material mounted on said frame, wherein the storage tanks are spaced a substantial distance from the peripheral edges of the frame accessible to supply vehicles, and extend upwardly from the frame a substantial distance, the improvement comprising means for loading particulate material into said storage tanks including an elongated conveyor member having a longitudinal axis, a hopper to receive material at one end of the conveyor, and a discharge conduit at the other end of the conveyor, a conveyor support mounted on said frame including a generally upwardly extending member, first means to pivot said conveyor support adjacent said frame and second means to pivot said conveyor to said conveyor support at the upper end thereof about substantially parallel axes transverse to the conveyor longitudinal axis, said conveyor support being pivoted to the conveyor at a position more closely spaced from the distance end than from the hopper end and forming the sole support for the discharge end, the discharge end thereby being supported above the storage tanks and tending to counterbalance the hopper in respect to the connection of the conveyor to the conveyor support, said conveyor being otherwise unsecured to permit said conveyor to be manually moved relative to said frame in a direction along its longitudinal axis while supported on said support between a first position wherein the major part of the conveyor is within the space defined by the peripheral edges of said frame and a second position wherein the hopper end of said conveyor protrudes outwardly from one side edge of said frame, and means adjacent the edge of the frame for slidably supporting the hopper end of the conveyor with the conveyor in its first position.

4,312,622

MANIPULATOR

Marcello Favareto, Turin, Italy, assignor to Comau S.p.A., Turin, Italy

Filed Feb. 14, 1979, Ser. No. 12,109
Claims priority, application Italy, Feb. 17, 1978, 67325 A/78
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—730 **9 Claims**

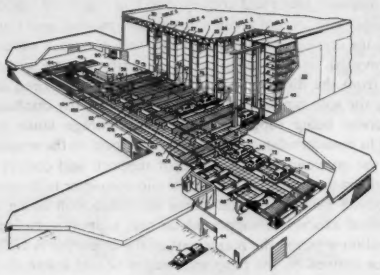


1. A manipulator with a working head operating through a sequence of movements of several degrees of freedom, comprising an upright base, a support carried by said base and rotating about one of its axes which is orthogonal to said base, an arm hinged to said support and rotating about a horizontal axis orthogonal to the axis of rotation of the support, a hollow member inside the arm and translatable longitudinally in such a manner that it can be extended and retracted along a direction orthogonal to the axis of rotation both of the support and of the arm, a column inside said hollow member which translates rigidly therewith and rotates about an axis parallel to the axis of translation, and a working head carried by the column and rotating about secondary axes, the first of which lies in a plane orthogonal to the direction of translation of the column and the second lies in a plane orthogonal to said first axis, actuator means for effecting the rotary and translatory movements of said members, and control apparatus arranged in said base for sequentially controlling said actuator means.

4,312,623
HIGH THROUGH-PUT MATERIALS HANDLING SYSTEM AND METHOD

James K. Allred, Salt Lake City, and Edward B. Quinn, Bountiful, both of Utah, assignors to Eaton-Kenway, Inc., Salt Lake City, Utah

Filed Mar. 15, 1979, Ser. No. 20,783
Int. Cl.[3] B65G 1/04
U.S. Cl. 414—786 4 Claims



1. A method for increasing the through-put of an automated materials handling system having a storage array comprising n aisles separating high rise storage bins, and S/R machine displaceable along the aisles and a pick up and a deposit station associated with each aisle, the method comprising the steps of:

queuing n input loads at the inlet side of an elongated conveyor;

assigning a storage address to the n input loads, which storage address is determined by a far to near aisle section sequentially applied to the n loads in the queue;

metering the n loads at spaced intervals onto the conveyor means, the spacing generally corresponding to the space between aisles such that the first input load traverses the distance of the storage array to the nth aisle and the second input load traverses the distance of the storage array to the n-1 aisle, the third input load to the n-2 aisle and so on, the last input load metered corresponding to the first aisle of the storage array;

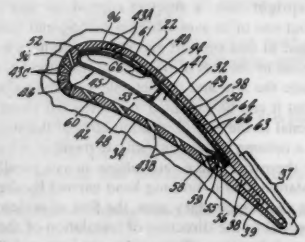
essentially simultaneously exchanging input loads for output loads at said conveyor; and

queuing the output loads at the outlet end of the conveyor means.

4,312,624
AIR COOLED HOLLOW VANE CONSTRUCTION

Frederick W. Steinbauer, Jr., West Palm Beach, and Erik A. Lindstrom, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 10, 1980, Ser. No. 205,833
Int. Cl.[3] F01D 5/18, 9/02
U.S. Cl. 415—115 10 Claims



1. A vane assembly for turbomachinery comprising:

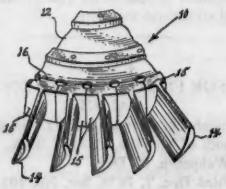
a hollow airfoil having an inner end and an outer end and including wall means defining a leading edge wall, a suction-side wall having a suction surface, a pressure-side wall having a pressure surface, and a trailing edge portion, said wall means defining a cooling fluid cavity extending from said inner end to said outer end of said airfoil and from said leading edge wall to said trailing edge portion;

insert means disposed within said cavity including dividing wall means dividing said cavity into a pressure side compartment including said pressure-side wall and a suction side compartment including said suction-side wall, each of said compartments extending from said leading edge wall to said trailing edge portion over the entire span of said airfoil, said pressure side compartment providing cooling fluid to cool said pressure-side wall and said suction side compartment providing cooling fluid to cool said suction-side wall, said compartments being sealed from one another, said insert means including a tubular member defining a plenum within said suction side compartment extending from said airfoil inner end to said airfoil outer end and from said leading edge wall to said trailing edge portion, said tubular member being closed at one of its ends and having cooling fluid inlet means at its other end, said pressure side compartment being closed at its end opposite to the closed end of said tubular member and having cooling fluid inlet means at its other end, said tubular member having a first wall portion adjacent and spaced from said suction-side wall defining a narrow cooling fluid space therebetween, said first wall portion having holes therethrough for directing cooling fluid from said plenum into said passageway to cool said suction-side wall.

4,312,625
HYDROGEN COOLED TURBINE

Lonnie W. Pinaire, Prospect, Ky., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 11, 1969, Ser. No. 832,505
Int. Cl.[2] F01D 5/18
U.S. Cl. 416—96 R 7 Claims

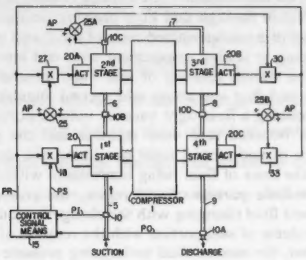


1. A bladed rotor for a turbine comprising a rotor disc having an outer periphery, at least one rotor blade having a base portion, said blade base portion being fixedly secured to the periphery of said disc, said base portion having a first centrally located passageway, said disc having an annular supply manifold containing a coolant operably associated with said centrally located passageway, a second passageway located within said base portion perpendicular with and connected to said centrally located passageway, a plurality of apertures located within said base portion perpendicular with and connected to said second passageway, a first plurality of passages within said blade connected to said apertures for supplying said coolant to said blade and a second plurality of passages within the central portion of said blade adjacent said first passages for returning said coolant to a return manifold in said disc, whereby coolant from said first plurality of passages is turned 180° and directed downward through said centrally located second plurality of passages.

4,312,626
MULTI-STAGE COMPRESSOR CONTROL SYSTEM AND METHOD

Kenneth P. Juran, Arvada, Colo., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 8, 1979, Ser. No. 18,821
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—53 **8 Claims**



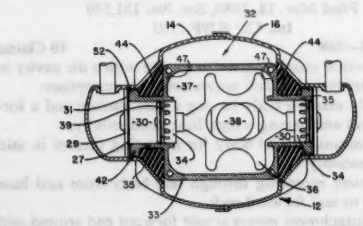
1. A control system for a multi-stage fluid compressor having an input receiving fluid and an output discharging compressed fluid and each stage having a variable volume cylinder comprising a plurality of actuating means for changing the volumes of the cylinders in accordance with control signals, means for sensing the pressure of fluid entering each stage and providing signals corresponding thereto, means for sensing the pressure of the discharge fluid and providing a corresponding signal, and means connected to all the actuating means and to all the sensing means for providing the control signals to the actuating means in accordance with the pressure signals from the sensing means.

5. A control method for a multi-stage fluid compressor having an input receiving fluid and an output discharging compressed fluid and each stage having a variable volume cylinder which comprises the steps of changing the volumes of the cylinders in accordance with control signals, sensing the pressure of fluid entering each stage, providing signals corresponding to the sensed pressures, sensing the pressure of the discharge fluid, providing a signal representative of the sensed discharge fluid pressure, and providing the control signals in accordance with all the pressure signals.

4,312,627
SUSPENSION AND SEAL SYSTEM FOR A REFRIGERATION MOTOR COMPRESSOR

John J. Jacobs, Pulaski, and Gerhard Kuhn, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 31, 1979, Ser. No. 7,866
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—363 **8 Claims**



1. Suspension and seal apparatus for a motor compressor unit including a compressor block having a central body, and at least one cylinder portion extending axially outward therefrom along an axis defined by the cylinder portion, the suspension and seal apparatus comprising:

a hermetically sealed shell encapsulating the motor compressor unit;

a flange portion projecting from the cylinder portion, toward an interior surface of the shell, generally perpendicular to the cylinder axis, wherein the flange portion is spaced from the central body of the compressor block and from the interior surface of the shell;

an outward planar member located adjacent to the flange portion axially outward thereof, and extending substantially parallel to the flange portion;

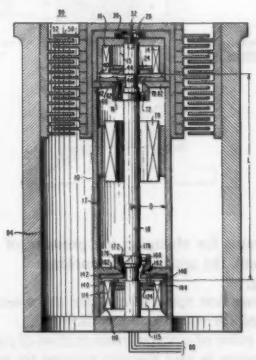
a resilient combination seal and support member captured between the flange portion and the outward planar member and having a peripheral surface in contact with the interior surface of the shell to separate the shell into first and second pressure chambers and to seal the first chamber from the second chamber, wherein a portion of the shell surface in contact with the resilient seal and support member is located directly therebelow to support the seal and support member, the compressor block, and the motor compressor unit in a vertical plane extending through the shell; and

resilient suspension means squeezed between the interior surface of the shell and surfaces of the motor compressor unit for resiliently suspending the motor compressor unit within the shell.

4,312,628
TURBOMOLECULAR VACUUM PUMP HAVING VIRTUALLY ZERO POWER MAGNETIC BEARING ASSEMBLY WITH SINGLE AXIS SERVO CONTROL

Akira Yamamura, Framingham, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed May 21, 1979, Ser. No. 40,893
Int. Cl.³ F04B *35/04*; F16C *35/00*
U.S. Cl. 417—424 **4 Claims**



1. In a turbomolecular vacuum pump including a pump housing; a vertically oriented hollow pump rotor disposed within the housing; a vertically oriented shaft affixed to the pump housing and extending inside of the pump rotor; the combination comprising:

first and second permanent magnet means affixed to the vertically oriented shaft;

first and second electromagnet means affixed to the vertically oriented shaft;

means for sensing the change in position of the pump rotor relative to the vertically oriented shaft;

means for controlling the position of the pump rotor relative to the vertically oriented shaft such that a new neutral force position is obtained in the presence of persistent disturbing forces;

the control means is driven by the signals produced by the sensing means;

said first and second electromagnet means are controlled by said control means;

the pump rotor has first and second ends;

the vertically oriented shaft has first and second ends;

the electromagnet means and the permanent magnet means are disposed on the vertically oriented shaft means near the ends thereof such that pole faces are formed between the respective first and second ends of the pump rotor and the vertically oriented shaft;

velocity sensing means is mounted on said vertically oriented shaft for sensing the rate of change of position of the pump rotor;

said velocity sensing means generates a signal which is fed to said control means; an electric drive means for turning said rotor in which said drive means comprises a brushless D.C. motor;

said pump rotor and said vertically oriented shaft have first and second mating frustro-conical shaped bearing surfaces for supporting the pump rotor in the event of a failure of the magnetic suspension.

4,312,629

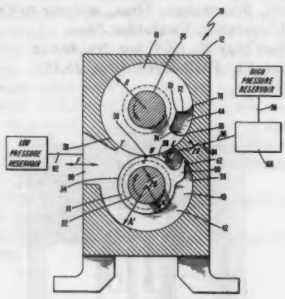
UNIVERSAL ROTATING MACHINE FOR EXPANDING OR COMPRESSING A COMPRESSIBLE FLUID

Emmanouil A. Pelekis, Athens, Greece, assignor to General Supply (Constructions) Co. Ltd., Athens, Greece

Filed Aug. 22, 1980, Ser. No. 180,349

Int. Cl.³ F01C *1/20, 11/00;* **F04C** *18/20, 23/00*

U.S. Cl. 418—191 **18 Claims**



1. Apparatus for changing the pressure of a mass of compressible fluid, the apparatus comprising:

a housing;

at least one first rotor of circular cross section of radius r mounted for rotation in said housing;

a second rotor of circular cross section of radius R mounted for rotation in said housing tangent to, and in fluid-tight relation with, said first rotor, wherein the angular direction of rotation of said second rotor is opposite that of said first rotor;

vane means fixed to the periphery of said first rotor for rotation therewith, said vane means including at least one vane member extending generally radially outward from the first rotor periphery, the thickness of said vane member measured in the tangential direction generally decreasing with increasing radial distance from the first rotor periphery;

vane relief means including at least one notch formed in the periphery of said second rotor cooperating with said vane means for providing rotation of said vane member past said second rotor, wherein inner surfaces of said housing form a segmented cylindrical annular region with the peripheral surface of said first rotor, said segmented annular region being bounded at the segment ends by the peripheral surface of said second rotor;

low pressure conduit means for communicating with said region at a first angular position with respect to the axis of said first rotor;

high pressure conduit means for communicating with said region at a second angular position, said second angular position being proximate one of the segment ends, valve means for intermittently interrupting communication with said region through said high pressure conduit after the passage of a predetermined mass of fluid, said vane member being in sealing engagement with said inner housing surfaces during rotation of said vane member between about said first and about said second angular positions and defining a fluid-tight variable volume portion of said region between said vane member and the peripheral surface of said second rotor proximate said second position, the mass of fluid being confineable within the variable volume portion of said region, the pressure of the confined fluid changing with the change in arcuate length and volume of said portion with the rotation of said vane member, the mass of fluid undergoing pressure change in said variable volume portion being sealed off from said vane relief notch by said vane member during pressure changing angular movement of said vane member past said second angular position, wherein said at least one vane member fixed to the peripheral surface of said first rotor has a tip extending a maximum radial distance of r′ from the axis of said first rotor, and wherein said at least one notch formed in the peripheral surface of said second rotor is configured for registration with said vane member, said notch having a maximum depth of at least $4'-r$ measured radially from the peripheral surface of said second rotor, and wherein said vane member has a face directed toward the confined fluid mass and said notch forms an axially directed edge with the peripheral surface of said second rotor, said vane member tip, said notch edge, and the inner peripheral wall of said housing all being in coincidence at one point during rotation of said vane member past said second angular position and wherein the profile of said vane face corresponds to the path traced on a hypothetical disc of radius r′ affixed to and rotating coaxially with said first rotor, from a radius r to a radius r′, by a point on said notch edge during the concurrent rotation of said first and second rotors, said notch edge slidingly engaging said vane face during rotation of said vane member between the point of tangency of said first and said second rotors and the point of coincidence for providing a fluid-tight seal between said face and said edge during rotation of said vane face between said respective points, said second angular position lying between said respective points.

4,312,630

HEATERLESS HOT NOZZLE

Nicola Travaglini, 51 Harris Crescent, Woodbridge, Canada

Filed Mar. 18, 1980, Ser. No. 131,510

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—568 **10 Claims**

1. An injection nozzle apparatus for use with a die cavity in a mold assembly and which nozzle assembly comprises:

a relatively massive body having a base surface and a forward end and having a high heat conductivity;

shoulder means on said body for mounting thereof in said mold assembly;

a passageway extending through said body from said base surface to said forward end;

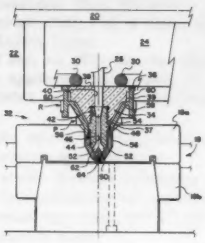
threaded attachment means at said forward end around said passageway

a nozzle tip member threadedly secured to said body at said threaded attachment means and having a passageway therethrough communicating with said passageway in

said body at least one opening for the ejection of molten plastics material therefrom;

an outer shell partially enclosing said body and exposing said base surface and at least partially encircling said nozzle tip member;

flange means on said shell adapted to engage said shoulder means on said body, said shell being adapted to be secured on such a mold assembly to hold said body in position thereon with said base in heat exchange relation with said mold assembly for the flow of molten pastics material from such assembly, through said nozzle tip member and into a die cavity, and wherein said outer shell is formed of a material having a lower thermal conductivity than that from which said body is formed and,



support means formed integrally with said outer shell for supporting said nozzle tip member.

4,312,631

SURFACE-ACTIVE COMPOUNDS BASED ON NATURAL ROSIN ACIDS

Ulrich Cuntze, Charlotte, N.C., and Heinz Uhrig, Steinbach, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 75,033

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840113

Int. Cl.[3] D06P *1/46, 1/653;* C09F *1/04;* B01F *3/12*

U.S. Cl. 8—583 22 Claims

1. A compound of the formula

$$A[(X—O)_x—Y—Z]_m$$

wherein

A is the radical of a rosin acid or of a derivative thereof capable of reacting with a low-molecular alkylene oxide,

x is a number of from 1 to 100 and

m is an integer of from 1 to 5,

X, when x and m are 1, is

$$—CH_2—CH_2— \text{ or } —CH_2—CH(CH_3)—,$$

and, when x or m or both are greater than 1, is

$$—CH_2—CH_2— \text{ or } —CH_2—CH(CH_3)—$$

or different groups of the formulae

$$—CH_2—CH_2— \text{ and } —CH_2—CH(CH_3)—,$$

Y, when m is 1, is $—C_nH_{2n}—$ and, when m is greater than 1, stands for the same or different groups of the formula

$$—C_nH_{2n}—,$$

wherein

n is 2 or 3,

Z, when m is 1, is —O—CO—CH_2—CH(SO_3M)—COOM, and when m is greater than 1, is —O—CO—CH_2—CH(SO_3M)—COOM or different groups of the formulae

$$—OH \text{ and } —O—CO—CH_2—CH(SO_3M)—COOM,$$

M being a cation, with the proviso that at least one Z is not —OH.

4,312,632

METHOD OF TANNING SKINS OR HIDES

Ottavio Torrini, Via A. Vespucci 40, Pontedera, Pisa, Italy (I-56025)

Filed Jul. 23, 1980, Ser. No. 171,377

Claims priority, application Italy, Jul. 24, 1979, 9497 A/79

Int. Cl.[3] C14C *3/06*

U.S. Cl. 8—94.27 7 Claims

1. A method of final tanning skins or hides in a tanning drum using chromium salts, wherein the total liquid phase contained in the tanning drum is less than or substantially equal to the amount of liquid contained in the skins or hides in their pelt state; said method further comprising the addition to the tanning drum, subsequent to tanning, of wood flour in an amount equal to about 0.5% to 3% of the pelt weight of said skins or hides; said wood flour functioning to absorb any residual liquid remaining in the tanning drum upon completion of tanning.

4,312,633

METHOD FOR RECOVERING 1,1,1-TRICHLOROETHANE FROM TEXTILE MATERIALS

Ken Kazama, Kamakura; Ikuo Muramoto, Yokohama, and Yasunaga Katsumata, Tokyo, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 103,940

Claims priority, application Japan, Dec. 22, 1978, 53-157541

Int. Cl.[3] D06L *1/10;* B01D *3/36;* C07C *17/38*

U.S. Cl. 8—142 7 Claims

1. A method for recovering 1,1,1-trichloroethane from a textile material, comprising the steps of:

introducing a textile material containing 1,1,1-trichloroethane into a bath containing hot water having a temperature of the azeotropic point, 64° C., of 1,1,1-trichloroethane and water, or more;

cooling the vapor mixture of 1,1,1-trichloroethane and water generated from said hot water bath, to condense it, and;

separating the condensed 1,1,1-trichloroethane from the condensed water,

which method is characterized in that the pH of said hot water bath is maintained at a level of 4.0 or more.

4,312,634

METHOD FOR TREATING CELLULOSIC MATERIALS PRIOR TO BLEACHING

Jerome Katz, P.O. Box 1544, Rochester, N.Y. 14603

Continuation of Ser. No. 855,354, Nov. 28, 1977, abandoned, and a continuation-in-part of Ser. No. 609,734, Sep. 2, 1975, Pat. No. 4,060,385, and Ser. No. 609,735, Sep. 2, 1975, Pat. No. 4,060,386, which is a continuation-in-part of Ser. No. 312,637, Dec. 6, 1972, Pat. No. 3,918,898. This application Oct. 16, 1979, Ser. No. 85,280

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.[3] D06L *3/02*

U.S. Cl. 8—111 38 Claims

1. A process for treating cellulosic goods prior to bleaching for a time sufficient to achieve commercially acceptable whiteness in a chemical bleach solution comprising the step of: intimately contacting said goods with an alkaline scour solution for from 5 seconds to 3½ minutes prior to bleaching, said alkaline scour solution having a temperature in the range 160°-212° F. and a pH from 10 to 14.

4,312,635

METHOD AND APPARATUS FOR FLUID ANALYSIS

Charles T. Carlisle, Katy, Tex., assignor to Geochem Research, Inc., Houston, Tex.

Filed Jun. 20, 1980, Ser. No. 161,351

Int. Cl.[3] G01N *33/18, 33/22*

U.S. Cl. 23—230 R 20 Claims

1. Method for fluid analysis, comprising the steps of:

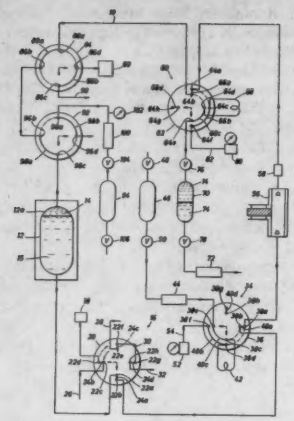
(a) circulating a first fluid in a closed loop at a predetermined temperature and pressure;

(b) adding a measured amount of a second fluid, which is immiscible in relation to the first fluid, into the loop;

(c) maintaining the second fluid in one portion of the loop so that another portion is free of the second fluid;

(d) adding a measured amount of a chemical tracer to the fluid in the loop; and

(e) sampling, from the portion of the circulation loop free of the second fluid, the first fluid mixed with tracer after



equilibrium is obtained to determine the concentration of tracer in the first fluid.

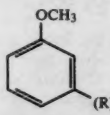
4,312,636

NOVEL ANISOLE MIXTURE AND GASOLINE CONTAINING THE SAME

Gary M. Singerman, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 12, 1980, Ser. No. 205,224
Int. Cl.³ C10L 1/18
U.S. Cl. 44—53 **24 Claims**

1. A novel anisole mixture containing anisole and a mixture of alkyl anisoles defined by the following formula:



wherein R is a straight or branched chain alkyl substituent having from one to four carbon atoms and n is an integer from 1 to 4, said novel mixture of anisoles having a boiling point of about 155° to about 230° C., wherein the number of individual anisoles in the novel anisole mixture ranges from about eight to about 30.

4,312,637

SLAG OUTLET FOR A GASIFICATION GENERATOR

Jordan Loftus, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

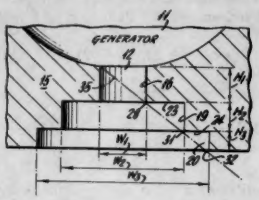
Filed Jun. 23, 1980, Ser. No. 162,286
Int. Cl.³ C10J 3/68
U.S. Cl. 48—77 **8 Claims**

1. In combination with a gasification generator wherein the products of combustion within said generator include a significant amount of non-gasifiable component which forms a liquid slag,

said generator having a bottom wall including means for transferring said slag to a following stage with minimum heat loss and maximum conversion of solids to gaseous product, comprising

a duct in said bottom wall for carrying said products of combustion therethrough,

said duct having an upper portion with constant diameter cross-section extending downward through said bottom wall and dimensions such that said liquid slag may run down the walls thereof and drip from the lowest point while maintaining the temperature of said slag above the minimum free flowing temperature, and



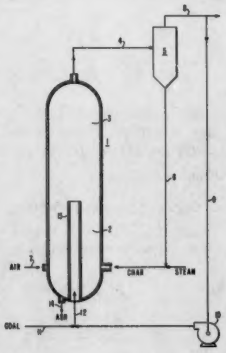
said duct having at least one lower portion with larger diameter cross-section extending downward from said drip point and having the bottom edge thereof above an extended diagonal of said upper portion which diagonal connects the point where said duct contacts the bottom of the generator and said drip point.

4,312,638

COAL GASIFICATION PROCESS

Valentin V. Koump, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 18, 1980, Ser. No. 141,497
Int. Cl.³ C10J 3/54
U.S. Cl. 48—197 R **3 Claims**



1. In a gasifier having an oxidizing atmosphere in its lower portion and a lower temperature reducing atmosphere in its upper portion, a process for gasifying carbonaceous matter to produce fuel gas containing negligible concentrations of undesirable polycyclic aromatic compounds comprising:

(1) selecting the fractional decomposition ratio R of the most stable polycyclic compound in the gas in said gasifier;

(2) selecting a temperature T for operating said gasifier and determining the rate constant K for the decomposition of said most stable polycyclic component at said temperature T;

(3) solving the equation $R=e^{-K\theta}$ for θ where θ is the residence time in seconds of said compound at temperature T;

(4) determining the minimum partial pressure of hydrogen necessary to reduce the concentration of said most stable polycyclic compound at temperature T and residence time θ by the ratio R;

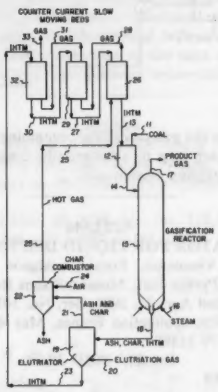
(5) admitting said carbonaceous matter into the said gasifier at a point where the partial pressure of hydrogen exceeds said minimum partial pressure of hydrogen;

(6) gasifying said carbonaceous matter under the values of said temperature, residence time, and partial pressure of hydrogen to produce fuel gas containing low concentration of polycyclic aromatic compounds.

4,312,639
PROCESS FOR HEATING SOLIDS FOR COAL GASIFICATION

Steven W. Johnson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1980, Ser. No. 219,127
Int. Cl.³ C10J 3/12
U.S. Cl. 48—210 **5 Claims**



1. In a method for the gasification of coal in a gasification reactor using hot inert heat transfer medium solids, which method includes removing a mixture of solids comprising ash, unreacted char and inert transfer medium from said gasification reactor and the char is burned to supply heat for heating the inert heat transfer medium solids, the improvements comprising:

(a) separating at least a portion of the ash and unreacted char in said removed mixture from the inert heat transfer medium solids in said removed mixture,

(b) burning the separated char in a combustion vessel thereby producing a hot gas,

(c) mixing said hot gas outside said combustor vessel with the separated inert heat transfer medium solids, thereby heating said inert heat transfer medium solids wherein said hot gas and heat transfer medium solids are mixed by passing said hot gas and heat transfer medium solids countercurrently through at least one mixing chamber, and

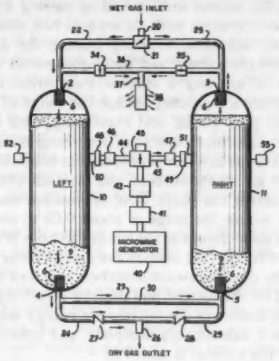
(d) passing the heated inert heat transfer medium solids produced in step (c) to said coal gasification reactor.

4,312,640
HEAT-REACTIVATABLE ADSORBENT GAS FRACTIONATOR AND PROCESS

Marcel G. Verrando, Cortland, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,390
Int. Cl.³ B01D 53/04
U.S. Cl. 55—33 **25 Claims**

1. In the process for removing a first polar gas from a mixture thereof with a second gas by flow of the gas mixture continuously through a stationary sorbent bed having a preferential affinity for the first polar gas which includes the steps of passing the gas mixture in contact with and from one end to another end of a first bed of the sorbent; sorbing first polar gas thereon and, as the sorption of the first polar gas continues, forming a concentration gradient of first polar gas in the first bed progressively decreasing from one end to the other end of the bed ranging from a substantial proportion of the first sorbent capacity therefor at one end to less than 20% of its capacity therefor at the other end, so as to produce a gaseous effluent which has a concentration of the first polar gas therein below a predetermined maximum; removing first polar gas sorbed on the second sorbent bed by passing a purge flow of effluent gas in contact with the sorbent bed, discontinuing the purge flow, and then resuming passing the gas mixture in contact with the sorbent bed, the improvement which consists essentially in utilizing a sorbent transparent to microwave energy having a

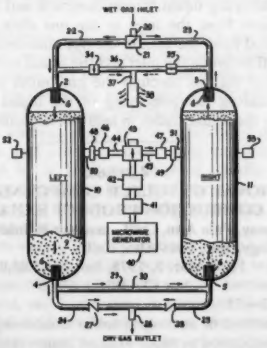


frequency within the range of about 0.03 to about 3000 giga Hertz, and desorbing first polar gas by applying during the purge flow microwave energy having a frequency within the range of about 0.03 to about 3000 giga Hertz at a temperature at which the sorbent is transparent to microwave energy, the microwave energy being preferentially absorbed by the first polar gas sorbed on the sorbent, and this gas thereby being desorbed, and halting application of the microwave energy when desorption of first polar gas is substantially complete, and before water of hydration of the sorbent is removed.

4,312,641
HEAT-REACTIVATABLE ADSORBENT GAS FRACTIONATOR AND PROCESS

Marcel G. Verrando, Cortland, and Donald H. White, Jr., Homer, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 25, 1979, Ser. No. 42,397
Int. Cl.³ B01D 53/04
U.S. Cl. 55—33 **33 Claims**



1. In the process for removing a first gas from a mixture thereof with a second gas by flow of the gas mixture continu-

ously through a sorbent bed having a preferential affinity for the first gas which includes the steps of passing the gas mixture in contact with and from one end to another end of a first bed of the sorbent; sorbing first gas thereon and, as the sorption of the first gas continues, forming a concentration gradient of first gas in the first bed progressively decreasing from one end to the other end of the bed ranging from a substantial proportion of the first sorbent capacity therefor at one end to less than 20% of its capacity therefor at the other end, so as to produce a gaseous effluent which has a concentration of the first gas therein below a predetermined maximum; removing first gas sorbed on the second sorbent bed by passing a purge flow of effluent gas in contact with the sorbent bed, discontinuing the purge flow, and then resuming passing the gas mixture in contact with the sorbent bed, the improvement which consists essentially in utilizing a sorbent transparent to microwave energy having a frequency within the range of about 0.03 to about 3000 giga Hertz, and combining with the sorbent a microwave absorbent capable of absorbing microwave energy within said range in an amount sufficient to activate and desorb sorbed first gas on the sorbent, and then desorbing first gas by applying during the purge flow microwave energy having a frequency within the range of about 0.03 to about 3000 giga Hertz at a temperature at which the sorbent is transparent to microwave energy, the microwave energy being preferentially adsorbed by the microwave absorbent and then activating first gas sorbed on the sorbent and thereby desorbing first gas, and halting application of the microwave energy when desorption of first gas is substantially complete, and before water of hydration of the sorbent is removed.

4,312,642

METHOD FOR THE SEPARATE DISCHARGE OF THE INDIVIDUAL PHASE STREAMS OF A MULTIPLE PHASE FLOW

Günter Lehr, Krefeld; Karl-Dieter Löhr; Uwe Hucks, both of Alpen, and Hugo Vernaleken, Walsrode, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,267

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908352

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—50 **4 Claims**

1. In a method for the separate discharge of the individual phase streams of a multiple component flow comprising a high viscosity slow flowing liquid or suspension and a gas flowing at least 100 times faster with the volumetric ratio of the gas to the liquid or suspension being greater than 1:1, the improvement comprising: transversely feeding the multi-component flow through an inlet and directly into a rotating helical channel for conveying liquid in one direction and having a liquid outlet spaced from the inlet in the one direction and a gas outlet spaced from the inlet in the opposite direction to form a gas shut-off between the inlet and the liquid outlet to effect the discharge of the gas through the gas outlet in said opposite direction during the conveying of the liquid by the helical channel to the liquid outlet in said one direction.

4,312,643

REMOVAL OF SULFUR COMPOUNDS FROM COMBUSTION PRODUCT EXHAUST

Dah Y. Cheng, Palo Alto, Calif., assignor to International Power Technology, Inc., Palo Alto, Calif.

Filed Mar. 3, 1978, Ser. No. 883,029

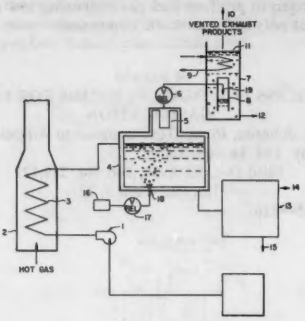
Int. Cl.³ B01D *47/00*

U.S. Cl. 55—73 **50 Claims**

1. A method of removing sulfur containing contaminants from a combustion product exhaust comprising:

A. contacting the combustion product exhaust with water to substantailly dissolve sulfur containing compounds;

B. heating said water to substantially reduce the solubility of gaseous sulfur containing compounds dissolved therein; and



C. contacting the gaseous sulfur containing compounds with a cold water trap to substantially dissolve said gaseous sulfur containing compounds.

4,312,644

GAS SEPARATOR FOR LIQUID DISPENSING DEVICE

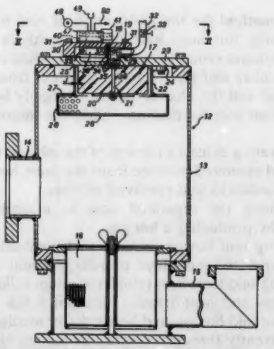
Rene Avenel, Vincennes, France, assignor to Constructions Mecaniques Pernin Sarl, Montreuil sous Bois, France

Filed Apr. 23, 1980, Ser. No. 142,892

Claims priority, application France, May 4, 1979, 79 11240; Dec. 21, 1979, 79 31390

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—168 **20 Claims**



1. A gas separator adapted to stop a flow of liquid in a liquid dispensing device when the liquid contains excess gas, and adapted to permit the purging of said excess gas, the gas separator comprising a tank through which the liquid flows, and a cylindrical float disposed in the tank and adapted to actuate liquid flow stop control means for actuating means for stopping the flow of liquid, the float being surrounded with slight peripheral play by a housing disposed at the top of the tank and being reciprocable between an upper position, when no excess gas is present, and a lower position, when excess gas is present, said stop control means and a duct for purging excess gas being disposed at the top of the tank in the vicinity of said housing, the stop control means and the duct for purging excess gas passing through the top wall of the tank in an area within the periphery of the float housing, the duct for purging excess gas including an orifice in the top wall of the tank, a box fixed to said wall and surrounding said orifice, and duct connected to said wall and fitted with a valve, the stop control means including a shaft attached to the float and passng through said orifice

and a connecting rod system extending into said box and actuating a control valve mounted outside said box.

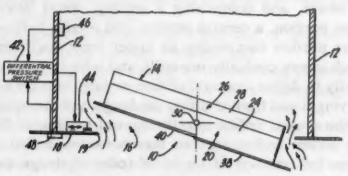
19. A gas separator adapted to stop a flow of liquid in a liquid dispensing device when the liquid contains excess gas, and adapted to permit the purging of said excess gas, the gas separator comprising a tank through which the liquid flows, and a cylindrical float disposed in the tank and adapted to actuate liquid flow stop control means for actuating means for stopping the flow of liquid, the float being surrounded with slight peripheral play be a housing disposed at the top of the tank and being reciprocable between an upper position, when no excess gas is present, and a lower position, when excess gas is present, said stop control means and a duct for purging excess gas being disposed at the top of the tank in the vicinity of said housing, the housing which surrounds the float at the top of the tank being defined by a cylindrical crown of smaller section than the tank, and a horizontal deflector screen having a cross section intermediate that of the tank and that of the crown disposed at a chosen distance below said crown.

4,312,645

SEPARATOR ASSEMBLY

Stratos Mavros, Fort Lee, and Dennis Wright, Waldwick, both of N.J., assignors to Parmatic Filter Corporation, Wayne, N.J.

Filed Mar. 10, 1980, Ser. No. 128,505
Int. Cl.³ B01D *46/46, 50/00*
U.S. Cl. 55—213 **8 Claims**



1. A separator assembly for an air intake duct of a turbine device for normally removing particulate matter entrained in air being introduced into said turbine device, said air being introduced to flow through said air duct in a first direction, said separtator assembly comprising:

separating means for removing particulate matter entrained in air passing therethrough;

frame means for supporting said separating means;

pivotal mounting means for pivotably mounting said frame means in said air duct so as to pivot about an axis extending in a second direction which is transverse to said first direction, and so that said frame means when mounted in said air duct is pivotably movable between a first position in which said separating means is arranged in said air duct so that substantially all of the air passing through said air duct passes through said separating means, and a second position in which said separating means is arranged so that air passing through said air duct bypasses said separating means;

sensing means for sensing the pressure differential of the air across said separating means; and

clamping means for normally clamping said frame means in said first position when said frame means is mounted in said air duct, said clamping means being operatively connected to said sensing means so that said clamping means is responsive to said sensing means sensing a pressure differential greater than a predetermined pressure difference to release said frame means from said first position so that the air flowing into said air duct causes said frame means to pivot about said axis toward said second position, whereby air flow will be maintained to the turbine device.

7. A separator assembly for an air intake duct of a turbine device for normally removing particulate matter entrained in air being introduced into said turbine device, said air being introduced to flow through said air duct in a first direction, said separator assembly comprising:

a first separating stage for removing particulate matter entrained in air passing therethrough;

first stage mounting means for fixedly mounting said first separator stage in said air duct so that substantially all of the air passing through said air duct passes through said first separating stage;

a second separating stage for removing particulate matter entrained in air passing therethrough;

frame means for supporting said second separator stage;

second stage mounting means for pivotably mounting said frame means in said air duct so as to pivot about an axis extending in a second direction which is transverse to said first direction, and so that said frame means when mounted in said air duct is pivotably movable between a first position in which said second separating stage is arranged in said air duct so that substantially all of the air passing through said air duct passes through said second separating stage, and a second position in which said second separating stage is arranged so that air passing through said air duct bypasses said second separating stage;

sensing means for sensing the pressure differential of the air across at least one of said first and second separating stages; and

clamping means for normally clamping said frame means in said first position when said frame means is mounted in said air duct, said clamping means being operatively connected to said sensing means so that said clamping means is responsive to said sensing means sensing a pressure differential greater than a predetermined pressure difference to release said frame means from said first position so that the air flowing through said air duct causes said frame means to pivot about said axis towards said second position, whereby air flow will be maintained to the turbine device.

4,312,646

GAS SCRUBBING TOWER

Volker Fattinger, Arlesheim, and Jüg Schneider, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 960,502, Nov. 13, 1978, Pat. No. 4,251,236, and Ser. No. 963,555, Nov. 24, 1978, Pat. No. 4,210,428. This application Sep. 21, 1979, Ser. No. 77,705
Claims priority, application Switzerland, Nov. 17, 1977, 14060/77; Oct. 20, 1978, 10877/78
Int. Cl.³ B01D *47/12*
U.S. Cl. 55—218 **6 Claims**

1. A gas scrubbing tower having a top region, a sump region and at least two washing stages therebetween, which tower comprises

(A) a gas entry means for introducing waste gas to be scrubbed into the tower, which entry means is located between the sump region and the first of said washing stages,

(B) gas exit means in the top region of the tower for the discharge of purified gas therefrom,

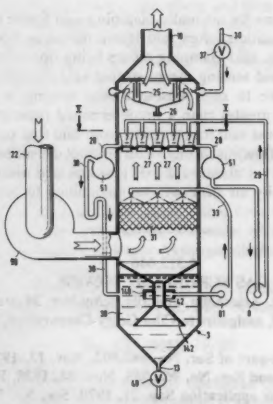
(C) the first washing stage, in the direction of upward gas flow from said entry means to said exit means, being constituted by at least one layer of packing elements, which layer extends in a horizontal plane across the cross-sectional area of the tower, and by supporting means for said packing elements,

(D) a first circulating line for conducting wash liquid from said sump region to the first washing stage, said first line being connected to said sump region, passing through pump means, and terminating in spray nozzles which are positioned in said first washing stage above said packing elements for irrigating said layer of packing elements therein,

(E) a second, packing-free washing stage, located in said scrubbing tower above said first washing stage,

(F) a second circulating line for conducting wash liquid from the sump region to the second washing stage, said second line being connected between said sump region and said second washing stage and opening into the latter;

(G) a sludge separator, constituting the said sump region of the tower, and comprising a settling vessel having an upper portion, a central portion and a base portion, the upper portion comprising an upper inner partition wall which tapers conically inwardly and with its apex downwardly to define a central orifice; an inlet tube for sludge-carrying liquid from said first washing stage and extending via the central orifice into the central portion of the settling vessel and connected therebetween, said inlet tube having mounted on the lower open end thereof in said sludge separator a conical funnel which widens downward and a deflector mounted in said funnel opposing the flow of liquid therethrough; a first outlet means from the settling vessel and extending from the central portion of the settling vessel, above the lower end of the liquid inlet tube radially toward the outside as part of said first circulating line, said first outlet means comprising a conduit having an intake opening and a cup-shaped casing positioned about said inlet tube and containing in its bottom said intake opening of said conduit, said conduit thus being adapted for receiving wash liquid rising along the outside



of said conical funnel; and a second outlet means connected to the base portion of the settling vessel for the removal therefrom of liquid charged with sediment; and

(H) conduit means for introducing water from outside the tower into said scrubbing tower.

6. A gas scrubbing tower having a top region, a sump region and at least two washing stages therebetween which tower comprises

(A) a gas entry means for introducing waste gas to be scrubbed into the tower, which entry means is located between the sump region and the first of said washing stages,

(B) gas exit means in the top region of the tower for the discharge of purified gas therefrom,

(C) the first washing stage, in the direction of upward gas flow from said entry means to said exit means, being constituted by at least one layer of packing elements, which layer extends in a horizontal plane across the cross-sectional area of the tower, and by supporting means for said packing elements,

(D) a first circulating line for conducting wash liquid from said sump region to the first washing stage, said first line being connected to said sump region, passing through pump means and terminating in spray nozzles which are positioned in said first washing stage above said packing elements for irrigating said layer of packing elements therein,

(E) a second, packing-free washing stage, located in said scrubbing tower above said first washing stage, and comprising a plurality of slot-defining gas baffling elements adapted for accelerating and then decelerating gas flow therethrough, and means for introducing a liquid into said elements, wherein each said element has a slot inlet thereto and a slot outlet therefrom and includes two coaxial guide surfaces defining an annular passage diverging from the slot inlet toward the slot outlet, the mean angle of divergence being in the range of 10° to 90°, and the cross-sectional area of the annular passage decreasing in the direction of gas flow from the slot inlet and then increasing towards the slot outlet and the mean radius of the cross-sectional area increasing in the direction towards the slot outlet, the liquid introduction means including means to produce a rotationally symmetrical liquid jet substantially parallel to said guide surfaces and in the same direction as the flow of gas through each element and comprising a deflector disc centrally disposed on the gas inlet side of said element and an axial feed tube through which liquid is fed onto the deflector disc in a direction opposite to that of the gas flow and is then deflected by the deflector disc rotationally symmetrically into the direction of the gas flow;

(F) a second circulating line for conducting wash liquid from the sump region to the second washing stage, said second line being connected between said sump region and said axial feed tube of said second washing stage;

(G) a sludge separator, constituting the said sump region of the tower, and comprising a settling vessel having an upper portion, a central portion and a base portion, the upper portion comprising an upper inner partition wall which tapers conically inwardly and with its apex downwardly to define a central orifice; an inlet tube for sludge-carrying liquid from said first washing stage and extending via the central orifice into the central portion of the settling vessel and connected therebetween, a first outlet means for removal of liquid of reduced sludge content from the settling vessel and extending from the central portion of the settling vessel, above the lower end of the liquid inlet tube radially toward the outside as part of said first circulating line, and a second outlet means connected to the base portion of the settling vessel for the removal therefrom of liquid charged with sediment; and

(H) conduit means for introducing water from outside the tower into said scrubbing tower.

4,312,647

IODINE ADSORBENT

Hiroyuki Tsuchiya; Kiyomi Funabashi, and Makoto Kikuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 66,041

Claims priority, application Japan, Aug. 14, 1978, 53-98209

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—387 **4 Claims**

1. An iodine adsorbent which comprises:

a carrier;

a film of iodine-adsorbent material deposited on the surface of the carrier; and

a liquid layer of organic material selected from the group consisting of dioctyl phthalate, dioctyl sebate, or silicone oil, coated on the surface of the film, said layer comprising a hydrophobic organic material that is a better solvent for iodine than water.

4. An iodine adsorbent which comprises:

a porous carrier;

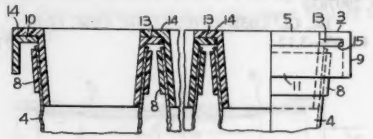
a film of iodine-adsorbent material deposited on the surface of the carrier; and

a liquid layer of organic material coated on the surface of the film, the volume of the organic material forming said layer being 0.2–0.8 times the pore volume of the carrier, said layer comprising a hydrophobic organic material that is a better solvent for iodine than water.

4,312,648
POCKET FILTER ARRANGEMENT

Charles E. Day, Jeffersonville, Ind., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Dec. 8, 1980, Ser. No. 214,270
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—378 6 Claims

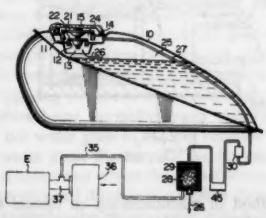


1. A pocket filter cartridge for removing particulate solids from a dirty gas stream, comprising:
- a plurality of relatively flat, sheath-like filter bags open at one end;
- a filter bag mounting frame adapted to be secured across the dirty gas stream;
- a plurality of apertured bag header plates secured across the mounting frame in overlapping side-by-side relation;
- each of said header plates having oppositely projecting edge portions and a projecting peripheral lip portion forming the marginal edge of an aperture opening into the open end of one of the filter bags;
- said edge portions overlapping the adjacent edge portions of the plates next to it;
- fastening means securing the open end of each of the filter bags to one of said lip portions; and
- said mounting frame having an interlocking channel portion spanning one side of the frame and a sealing edge portion spanning the other side of the frame; and
- said channel portion receiving the outer edge portion of the outermost plate at said one side of the frame and said sealing edge portion cooperating with the outer edge portion of the outermost plate at said other side of the frame.

4,312,649
FUEL VAPOR ARRESTING MEANS FOR MOTORCYCLE ENGINE FUEL SYSTEM

Hisashi Fujii, Akashi; Mikio Kamitake, Kobe; Ryohei Mimura, Kakogawa, and Katsumi Umezawa, Kobe, all of Japan, assignors to Kawaski Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jan. 7, 1980, Ser. No. 109,990
Claims priority, application Japan, Jan. 9, 1979, 54-1678[U]
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—387 5 Claims

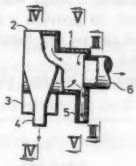


1. Fuel system for a motorcycle engine having intake passage means, said fuel system comprising fuel reservoir means having fueling port means, and cap means adapted for closing the port means, said fueling port means being provided with inner seat means and outer seat means, said cap means including inner cap disc means adapted to be fluid-tightly engaged with said inner seat means and outer cap disc means adapted to be fluid-tightly engaged with said outer seat means to thereby form buffer chamber means between said inner and outer cap means, vent passage means for connecting the buffer chamber means with inside of the fuel reservoir means, fuel vapor absorbent means connected on one hand through conduit means with said buffer chamber means and opened on the other hand to atmosphere.

4,312,650
PARTICLE SEPARATOR

Masao Seki; Hideo Sato, both of Yokosuka; Takashi Kawata, Chiba; Akira Omori, Koganei, and Hidekazu Abe, Yokohama, all of Japan, assignors to Ishikawajima-Harima Kukogto Kabushiki Kaisha, Japan

Filed Oct. 7, 1980, Ser. No. 194,888
Claims priority, application Japan, Oct. 31, 1979, 54-150227[U]
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—459 B 2 Claims



1. A particle separator comprising:
- (a) a cylinder disposed substantially horizontally;
- (b) a scroll disposed so as to surround and between the ends thereof communicate with substantially the upper half of said cylinder at one end thereof and for a portion of its length thereby defining a swirling chamber;
- (c) a substantially vertical inlet extending from and communicating with one end of said scroll enabling dust or particle laden gas flowing through said inlet to swirl in said swirling chamber;
- (d) a first substantially vertical dust-particle outlet extending from and communicating with the other end of said scroll enabling dust or solid particles separated from gas in said swirling chamber to flow into said first outlet;
- (e) a gas outlet extending from the other end of said cylinder and mounted coaxially thereof for discharging gas from said cylinder through said gas outlet; and
- (f) a second substantially vertical dust-particle outlet extending from the bottom of said cylinder adjacent said gas outlet providing means for dust or solid particles still entrained in the gas flowing through said cylinder to be collected in said second dust-particle outlet.

4,312,651
AIR CLEANER HOUSING

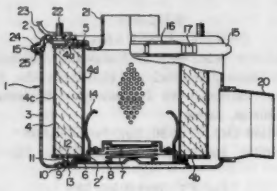
Hisao Esaki, Nagoya, and Yoshiro Uchida, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 11, 1980, Ser. No. 139,242
Claims priority, application Japan, May 30, 1979, 54-72596[U]
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—502 5 Claims

1. An air cleaner housing comprising:
- a generally cylindrical case having an inlet opening an imperforate bottom and an open top for enclosing an annular air cleaning filter element provided with end plates;
- a detachable cap covering said top, at least one of said case and said cap being formed of a synthetic resinous material;
- a holding plate mounted in said case adjacent said bottom for movement axially of said case;
- a stepped support plate secured to the bottom of said case

and having lost motion engagement with said holding plate for restricting the axial movement of said holding plate;

sealing means, including a sealing member secured to said cap in a manner to be brought into intimate contact with one end plate of the filter element and another sealing



member secured to said holding plate in a manner to be brought into intimate contact with the other end plate of the filter element, to provide a seal between said filter element and said cap on one hand and said holding plate on the other; and

spring means urging said holding plate toward said cap.

4,312,652

SEPARATION SYSTEM

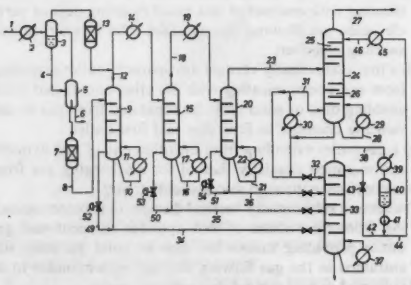
Klaus D. Mikulla, Geretsried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,452

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843982

Int. Cl.³ F29J *3/02*

U.S. Cl. 62—29 **11 Claims**



1. In a process for the separation of a gas mixture comprising a major amount of hydrocarbons wherein the gas mixture is liquefied by single or multi-stage partial condensation in one or more heat exchangers at least partially cooled by external refrigerant, where the liquid fractions thus formed are further separated in a first rectifying column, and where following the last stage of partial condensation the resultant gaseous fraction is subjected to rectification in a second rectifying column, each of said rectification columns having an enriching zone and a stripping zone, and wherein said gas mixture is derived from a source other than said rectification columns,

the improvement which comprises the intermediate step of stripping the most volatile components from the liquid fractions before the latter are fed into said first rectifying column, so as to substantially decrease the cooling requirements of said first rectifying column, said stripping being conducted in a stripping column separated from said rectification columns.

4,312,653

PROCESS FOR THE PRODUCTION OF A COATED GLASS BODY

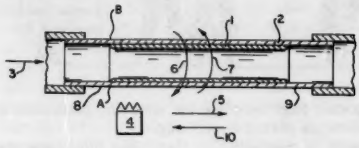
Hartmut Schneider, and Alfred Papp, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 119,017

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907833

Int. Cl.³ C03B *37/07, 37/075;* C03C *17/02*

U.S. Cl. 65—3.12 **5 Claims**



1. In a process for producing a coated glass body and particularly a coated glass body for use in the production of glass fiber for a light waveguide, said process including rotating a body, and forming a plurality of glass layers on a surface of the rotating body with each glass layer being formed by a cycle including applying at least one substance containing a glass forming material on a surface of the rotating body, and then transforming the glass forming material into a glass layer by heating a local zone of the surface of the body and moving the zone in a predetermined direction along the surfaces of the body, the improvement comprising selectively changing a selected one of the direction of rotation of the body relative to the direction of moving of the heating zone along the surface of the body and the point of starting the step of heating as the heating zone is moved along the surface of the body during each cycle from the point of starting the previous cycle so that the effect of anisotropy of the combined layers of glass is largely eliminated.

4,312,654

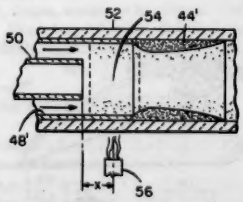
METHOD AND APPARATUS FOR MAKING LARGE DIAMETER OPTICAL WAVEGUIDE PREFORMS

Arnab Sarkar, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 913,754, Jun. 8, 1978, abandoned. This application Dec. 15, 1980, Ser. No. 216,556

Int. Cl.³ C03B *37/025, 37/07*

U.S. Cl. 65—3.12 **17 Claims**



1. In a method of manufacturing an optical device, said method being of the type that includes the steps of

flowing a vapor mixture including at least one compound, glass-forming precursor, together with an oxidizing medium, through a hollow, cylindrical substrate, and

heating said substrate and contained vapor mixture with a heat source that moves relative to said substrate in a longitudinal direction, whereby a moving hot zone is established within said substrate, such that a suspension of particulate material is produced, at least a portion of said particulate material traveling downstream where at least a

portion thereof comes to rest on the inner surface of said substrate to form a deposit on said inner surface,

the improvement which comprises

flowing an unconfined stream of gas through the axial region of said substrate in the hot zone thereof so that said stream is the sole mechanism that acts to confine the flow of said vapor mixture to an annular channel adjacent the substrate surface, whereby the deposition efficiency of the reaction of said vapor mixture is increased.

4,312,655

DISPOSAL OF WASTE GLASS

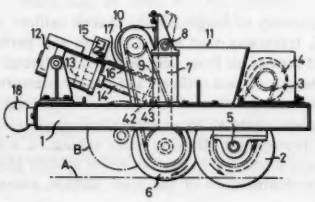
Ernest A. Pack, Uxbridge, England, assignor to BHF Engineering Limited, Greenford, England

Filed Apr. 14, 1980, Ser. No. 139,678

Claims priority, application United Kingdom, Aug. 15, 1979, 28461/79; Dec. 13, 1979, 43020/79

Int. Cl.³ C03B *1/00*

U.S. Cl. 65—28 20 Claims



1. In an apparatus for use in flattening hot waste glass comprising two rollers independently driven for rotation in opposing directions and having a gap therebetween, the two rollers being normally urged towards each other, means for feeding the hot waste glass to the gap between said rollers to flatten the waste glass, means for discharging the flattened waste glass, tank means for receiving the discharged glass and shattering the same to form cullet suitable for recycle directly to a molten glass furnace without further crushing, the improvement wherein at least one of the rollers is pivotally mounted and is provided with means for swinging the roller about its pivotal mounting away from the other roller when the roller is forced a predetermined distance from its normal position.

16. In a method of disposing of hot waste glass by providing an apparatus comprising two rollers independently driven for rotation in opposing directions and having a gap therebetween, the two rollers being normally urged towards each other, feeding the hot waste glass to the gap between said rollers to flatten the waste glass, discharging the flattened waste glass into a tank of cold water where the glass shatters to form cullet which can be recycled directly to a molten glass furnace without further crushing, the improvement which comprises using as the flattening apparatus one which comprises two rollers independently driven for rotation in opposing directions and having a gap therebetween through which hot glass fed to the apparatus can be flattened, the two rollers being normally urged towards each other, at least one of the rollers being pivotally mounted and being provided with means for swinging the roller about its pivotal mounting away from the other roller when the roller is forced a predetermined distance from its normal position.

4,312,656

GLASS RIBBON WIDTH CONTROL METHOD IN FLOAT PROCESS

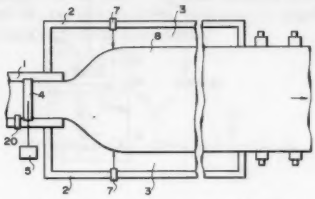
Hiroshi Masuda; Hirohiko Sakai, and Syoji Saito, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 28, 1980, Ser. No. 154,053

Claims priority, application Japan, Jun. 2, 1979, 54-69307

Int. Cl.³ C03B *18/04*

U.S. Cl. 65—29 9 Claims



1. A method for controlling the width of a glass ribbon in a float process of flat glass production in which a molten glass is poured through a tweel onto a molten metal in a bath to form a glass ribbon floating and advancing on the molten metal bath, the method comprising:

detecting the width of the glass ribbon at a location remote from the tweel,

comparing the detected width with a predetermined standard and generating an error signal representing the error therebetween,

discriminating between a first case where said error signal is within a predetermined range of the error and a second case where said error signal is outside said range,

generating a first feedback control signal from said error signal in accordance with an integral control mode in the first case and a second feedback control signal obtained from said error signal in accordance with a proportional-plus-integral control mode of a sampled data system in the second case,

detecting the temperature of a molten glass to be supplied to the bath and generating a temperature signal representing the detected temperature,

generating a first feedforward control signal from said temperature signal, and

regulating the tweel to manipulate the rate of supplying a molten glass to the bath under command of said first feedback control signal in the first case and said second feedback control signal in the second case in such a manner as to make said error disappear and additionally under command of said first feedforward control signal in such a manner as to compensate the influence of the temperature change of the molten glass to be supplied to the bath.

4,312,657

METHOD OF AND APPARATUS FOR SENSING THE LEVEL OF MOLTEN GLASS IN A GLASS MELTING FURNACE

Sheldon A. Canfield, Newark, and Paul S. Sanik, Westerville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

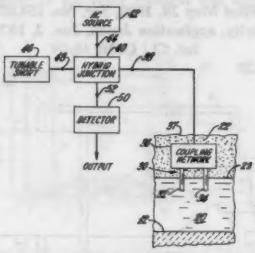
Filed Nov. 14, 1980, Ser. No. 206,809

Int. Cl.³ C03B *3/00*

U.S. Cl. 65—29 7 Claims

1. A method of detecting the level of molten glass in a glass melting furnace, said method comprising the steps of: positioning two members in the molten glass in said furnace; supplying a source of alternating current to said members; detecting the impedance of a circuit comprising said two members and the electrical connection therebetween through said molten glass; and generating a signal responsive to the impedance detected as an indication of the level of molten glass in said furnace.

4. An apparatus for detecting the level of molten glass in a glass melting furnace, said apparatus comprising: two members positioned in the molten glass in said furnace; a source of alternating current connected to said members; and means for



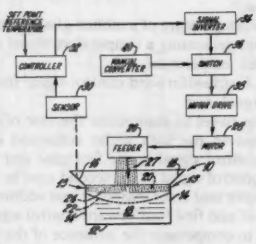
detecting the impedance of a circuit comprising said two members and the electrical connection therebetween through said molten glass; and means for providing an output responsive to the detected impedance as an indication of the level of molten glass in said furnace.

4,312,658

METHOD OF AND APPARATUS FOR CONTROLLING BATCH THICKNESS AND GLASS LEVEL IN A GLASS FURNACE

James R. Mayer, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 15, 1980, Ser. No. 216,701
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—29 **19 Claims**



1. A method of controlling the thickness of a blanket of batch floating on a body of molten glass in a glass melting furnace, said method comprising the steps of: feeding batch to the surface of said blanket of batch material; sensing the radiation reflected from a sidewall of said furnace above said blanket of batch; and controlling the feed rate of said batch in response to the sensed radiation to maintain said blanket of batch at a predetermined thickness.

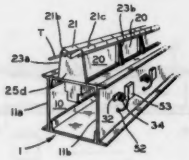
8. An apparatus for controlling the thickness of a blanket of batch floating on a body of molten glass in a glass melting furnace having a sidewall and a feeder means for supplying batch to said furnace such that said batch is supplied above said body of molten glass, said apparatus comprising: means for sensing the radiation reflected from said sidewall above said blanket of batch; and means for controlling the batch feed rate of said feeder means in response to the radiation sensed by said sensing means to maintain said blanket of batch at a predetermined thickness.

4,312,659

AIR SUPPORT SYSTEM FOR GLASS TUBING ALLEY

Salvatore C. Panarello, Hammonton, and Edward G. Schmitzler, Vineland, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 68,379, Aug. 21, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,528
Int. Cl.³ C03B *15/18*
U.S. Cl. 65—84 **22 Claims**



1. Apparatus for supporting hot glass tubing drawn from a soure of molten glass on a cushion of air comprising:

(1) means defining a horizontally elongated chamber disposed beneath the drawpath of the tubing;

(2) means for maintaining a selected elevated air pressure in said chamber;

(3) said chamber having a top wall defining a V notch in vertical cross-section within which the tubing is disposed; and

(4) a plurality of longitudinally spaced orifices in said top wall, traversing said vertex portion and permitting upward flow of air from said chamber, the lateral width and the length of said orifices, and the air pressure being selected as a function of the diameter and weight range of the glass tubing to be air supported.

20. A process for drawing glass tubing of a variety of weights and diameters from a source of molten glass without significant deformation of the glass surface, comprising the steps of:

(1) drawing the hot glass tubing from a source of molten glass in a substantially horizontal direction;

(2) passing the hot deformable portion of the drawn glass tubing between the walls of an horizontally elongated V-shaped notch, and

(3) supporting the glass tubing in the V-shaped notch without contact therewith by an upward flow of air supplied primarily from the bottom vertex portion of said V-shaped notch.

4,312,660

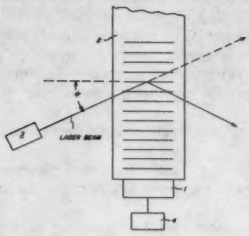
ACOUSTO-OPTIC DEVICE AND METHOD USING TELLURITE GLASS COMPOSITION

Gerald E. Blair, Pittsford, N.Y.; J. Bradford Merry, Springfield, Va., and James M. Wylot, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 29,094, Apr. 11, 1979, Pat. No. 4,265,517. This application Oct. 20, 1980, Ser. No. 198,574
Int. Cl.³ C03B *25/00*
U.S. Cl. 65—85 **4 Claims**

1. A process for decreasing the acoustic attenuation of an

alkali metal oxide-tellurite glass composition comprising annealing said glass at a temperature within the range of from



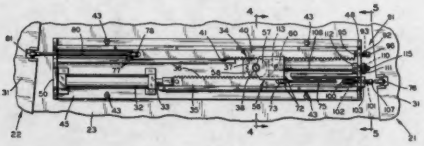
about 27 to 36% of the melt temperature of the glass for a time of at least 120 hours.

4,312,661

APPARATUS FOR BENDING GLASS SHEETS

Floyd T. Hagedorn, Oregon, and Robert G. Revells, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 28, 1980, Ser. No. 182,019
Int. Cl.³ C03B *23/023*
U.S. Cl. 65—290 **8 Claims**



1. Apparatus for bending glass sheets comprising: a frame, a press member mounted on said frame and having a shaping surface thereon for supporting a heat-softened sheet of glass, said press member having a main body section and a pair of opposite articulated end sections mounted for pivotal movement relative to said main body section, means for moving said articulated end sections simultaneously relative to said main body section, said moving means including a fluid actuating cylinder having an axially movable piston provided with a piston rod, a first gear rack connected at the opposite ends thereof to said piston rod and one of said end sections, respectively, a second gear rack connected to said other end section, and a pinion gear interposed between and meshing with both of said gear racks.

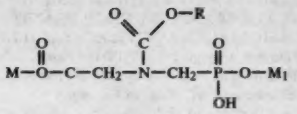
4,312,662

N-SUBSTITUTED CARBOXY-N-PHOSPHONOMETHYLGLYCINES AND THE SALTS THEREOF AS HERBICIDES

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

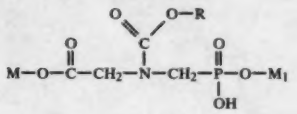
Filed Dec. 31, 1979, Ser. No. 108,727
Int. Cl.³ A01N *57/26*; C07C *125/06*
U.S. Cl. 71—86 **9 Claims**

1. A method of controlling undesired plants which comprises contacting said plants or the plant growth medium with a herbicidal amount of a compound of the formula



wherein R is selected from the group consisting of C_1–C_8 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_2–C_4 haloalkynyl and phenyl; and M and M_1 are independently hydrogen or alkali metal.

4. A compound of the formula



wherein R is selected from the group consisting of C_1–C_8 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_2–C_4 haloalkynyl and phenyl; and M and M_1 are independently hydrogen or alkali metal.

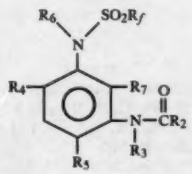
4,312,663

CYCLICACYLAMINOPERFLUOROALKANESULFONANILIDES AND DERIVATIVES THEREOF

Ezzat A. Mikhail, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 18, 1980, Ser. No. 188,558
Int. Cl.³ A01N *43/08, 41/08*; C07C *143/72*; C07D *307/68*
U.S. Cl. 71—88 **12 Claims**

1. A compound of the formula



wherein

R_f is lower perfluoroalkyl;

R_2 is cycloalkyl; polycycloalkyl; phenyl; nitro-, halo-, alkyl- or alkoxy- substituted phenyl; biphenyl; phenylalkyl; phenoxyalkyl; halophenoxyalkyl; or a heterocyclic group of 4 to 10 atoms, which can contain only carbon, hydrogen, oxygen, sulfur, and nitrogen;

R_3 is hydrogen, alkyl, or unsaturated alkyl;

R_4 and R_5 are independently hydrogen, lower alkyl, cyano, nitro, halo, phenyl, benzoyl, benzenesulfonyl, or phenylthio;

R_6 is hydrogen, acyl, alkoxycarbonyl, alkoxythiocarbonyl, haloalkoxycarbonyl, haloalkoxythiocarbonyl, aryloxycarbonyl, or phenylalkoxycarbonyl, and agriculturally acceptable salts of the acid form compounds;

R_7 is hydrogen or halogen;

provided that

R_2, R_3, and R_6 individually contain not more than twelve carbon atoms.

11. A method for terminating the life cycle of higher plants which comprises contacting said plants with an effective amount of a compound according to claim 1.

4,312,664

COMPOSITIONS AND METHODS FOR IMPROVING THE TOLERANCE BY CROP PLANTS OF HERBICIDALLY ACTIVE ACETANILIDES

Robert R. Schmidt, Cologne, and Wilfried Faust, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

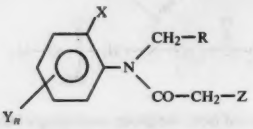
Filed Jun. 4, 1979, Ser. No. 45,371

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828303

Int. Cl.³ C07D *231/02;* A01N *9/02, 9/22*

U.S. Cl. 71—92 15 Claims

1. Herbicidal composition comprising as an active ingredient, an acetanilides of the formula



(II)

in which

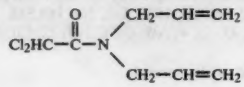
R is pyrazol-1-yl or substituted pyrazol-1-yl, wherein the substituents are selected from the group consisting of halogen and alkyl of 1 to 4 carbon atoms;

X and Y, which may be identical or different, each represent straight chain or branched alkyl with 1 to 4 carbon atoms;

Z is chlorine or bromine; and

n is 0, 1 or 2 and herbicidally active acid-addition salts thereof;

and N,N-diallyl-dichloroacetamide, of the formula



(I)

as an antidote against damage to crop plants.

4,312,665

RIPENING OF GRAPES

Sidney R. Siemer, Fresno, Calif.; Richard S. Gordon, St. Louis, Mo., and Louis G. Nickell, Chicago, Ill., assignors to W. R. Grace & Co., Columbia, Md.

Continuation-in-part of Ser. No. 33,884, Apr. 27, 1979, Pat. No. 4,231,788. This application Jun. 9, 1980, Ser. No. 157,572

The portion of the term of this patent subsequent to Apr. 11, 1997, has been disclaimed.

Int. Cl.³ A01N *37/02*

U.S. Cl. 71—113 8 Claims

1. A method for increasing the % Brix in grapes prior to harvest by applying a compound selected from the group consisting of carboxylic acid salts containing from 3 to 5 carbon atoms in combination with a surfactant, wherein the acid salt/surfactant weight ratio is from 10 to 1.

4,312,666

STEEL MAKING PROCESS

Harry Serbent, Hanau; Gerhard Reuter, Frankfurt; Wolfram Schnabel, Hattersheim, and Heinz Eichberger, Bad Soden, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,288

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905339

Int. Cl.³ C21B *13/12*

U.S. Cl. 75—11 6 Claims

1. A process for separating non-ferrous metals or compounds thereof from a mixture thereof with ferrous metal or compounds which comprises:

(a) introducing said mixture after pelletizing or rolling and solid carbonaceous reducing agent into a rotary kiln and thereon volatilizing a substantial portion of the non-ferrous metal content while reducing a substantial portion of the ferrous metal content to sponge iron;

(b) discharging solids including sponge iron from said rotary kiln and sieving the same with a parting size of about 3 to 10 mm;

(c) melting the coarse fraction in an electro-slag resistance process;

(d) subjecting the fine fraction to an electromagnetic separation to obtain a magnetic fraction and an unmagnetic fraction;

(e) melting the magnetic fraction from step (d) in an electro-slag resistance process, and

(f) incorporating in and bonding said unmagnetic fraction obtained from step (d) to the feed mixture for said rotary kiln by a rolling or pelletizing operation.

4,312,667

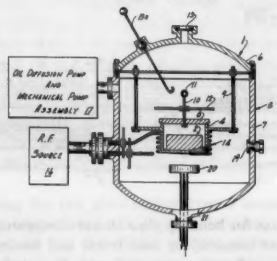
METHOD OF FORMING LARGE, MINIMAL GRAIN COPPER BILLET

Jacques P. Guertin, Cupertino, Calif., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 17, 1980, Ser. No. 130,993

Int. Cl.³ C22B *15/00*

U.S. Cl. 75—72 14 Claims



1. The method of forming a copper billet having a minimal grain structure comprising the steps of; placing a solid mass of generally high purity, oxygen free, high conductivity copper into an enclosed chamber, creating a vacuum in said chamber, increasing the temperature within said chamber to melt said copper mass and for degasification thereof and cooling the melted copper mass in said vacuum nondirectionally at a rate of approximately 3°–15° C. per hour for resolidification and recrystallization thereof into said copper billet.

4,312,668

APPARATUS FOR THE TREATMENT OF MOLTEN METAL

Geoffrey Mannion, Horsham, and Patrick V. Palmer, Hove, both of England, assignors to The International Meehanite Metal Company Limited, Surrey, England

Filed Nov. 9, 1979, Ser. No. 92,676

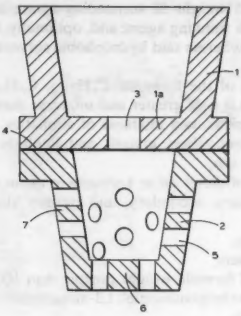
Claims priority, application United Kingdom, Nov. 14, 1978, 44359/78; May 18, 1979, 17320/79

Int. Cl.³ C22C *33/08*

U.S. Cl. 75—130 R 7 Claims

1. A treatment unit for molten metal which is adapted to be operatively positioned with respect to a pouring ladle such that molten metal poured into the treatment unit is received in the ladle, the treatment unit comprising a pouring bush opening into the top of an additive container, the container including a cover and a plurality of holes provided in at least one of the

base or peripheral walls thereof, the holes allowing the passage therethrough of molten metal wherein molten metal poured into the pouring bush flows therethrough into the additive



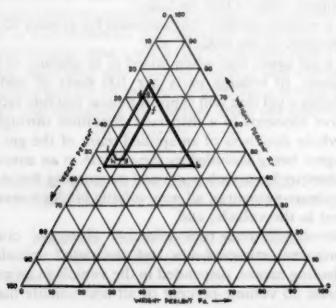
container and out of the holes therein into a pouring ladle, and means for restricting contact of molten metal being treated with the atmosphere.

4,312,669

NON-EVAPORABLE TERNARY GETTERING ALLOY AND METHOD OF USE FOR THE SORPTION OF WATER, WATER VAPOR AND OTHER GASES

Claudio Boffito; Aldo Barosi, and Alessandro Figini, all of Milan, Italy, assignors to SAES Getters S.p.A., Milan, Italy

Filed Jan. 24, 1980, Ser. No. 115,051
Claims priority, application Italy, Feb. 5, 1979, 19901 A/79
Int. Cl.³ C22C *16/00*
U.S. Cl. 75—177 **8 Claims**



1. A process for the sorption of gas from a closed vessel comprising the steps of:

(A) introducing into the vessel a non-evaporable ternary gettering alloy whose composition in weight percent when plotted on a ternary composition diagram in weight percent Zr, weight percent V and weight percent Fe lies within a polygon having as its corners the points defined by:

a—75% Zr - 20% V - 5% Fe
b—45% Zr - 20% V - 35% Fe
c—45% Zr - 50% V - 5% Fe

(B) evacuating the vessel to a pressure of less than 10^{-2} torr

(C) activating the gettering alloy by heating the ternary alloy to a temperature of greater than 700° C. and,

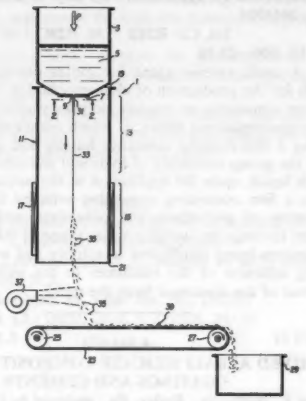
(D) reducing the temperature to a value between 400° C. and 25° C.

4,312,670

SYSTEM FOR STRETCH CASTING FILAMENTARY SHAPED BODIES

Stephen L. Colucci, Mishawaka, Ind., assignor to National-Standard Company, Niles, Mich.

Filed Jan. 29, 1980, Ser. No. 116,619
Int. Cl.³ B22F *3/00*
U.S. Cl. 75—200 **13 Claims**



1. A method of forming filamentary-shaped bodies comprising the steps of:

(a) providing a viscoelastic forming mix comprised of a major portion of at least one particulate metallic compound capable of undergoing reduction to its free metal state,

(b) pressurizing the mix to extrude same through an orifice to form an extrudate thereof,

(c) stretching the extrudate under substantially only the force of gravity to reduce its cross-sectional area and cast the extrudate into a continuous filamentary body having a desired uniform cross-sectional area, and

(d) hardening the continuous filamentary body to impart green strength thereto.

4,312,671

PROCESS FOR THE PREPARATION OF A CONGLOMERATE SAND ANF PRODUCT

Paul H. R. Williame, Asnieres, France, assignor to Produits Ballu-Schuiling S.A., Clichy, France

Filed Apr. 29, 1980, Ser. No. 145,321
Claims priority, application France, May 7, 1979, 79 11449
Int. Cl.³ B28B *7/34*
U.S. Cl. 106—38.2 **11 Claims**

1. In a process for preparing conglomerate sand by mixing a sand with a setting-binder agent, the improvement comprising as said setting-binder agent the reaction product of magnesium silicate and an arylsulphonic acid in aqueous medium, said magnesium silicate being present in an amount of at least 5% by weight based on said sand and said arylsulphonic acid being present in an amount of at least 25% by weight based on said magnesium silicate.

4,312,672
RELEASE AGENT FOR REMOVING PLASTICS, ESPECIALLY POLYURETHANE PLASTICS FROM MOLDS

Johannes Blahak, Gauting-Buchendorf, and Hermann Menk, Bodolz, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 22, 1980, Ser. No. 142,754

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916700

Int. Cl.³ B28B *7/36;* **B29C** *1/04*

U.S. Cl. 106—38.22 **9 Claims**

1. A mold release agent for molds especially aluminum molds for the production of elastomer bodies from a reaction mixture containing an organic polyisocyanate and a reactive hydrogen-containing material, which comprises a liquid containing a film-forming substance having end groups selected from the group consisting of hydroxyl and amino end groups, which liquid, upon the application to the surface of the mold, forms a film containing a member selected from the group consisting of polyethers and polyesters with a molecular weight (average by weight) in the range of 800 to 5,000, said end groups being insufficient in activity and number to cause strong adhesion of the elastomer to the mold and prevent removal of the elastomer from the mold.

4,312,673
MIXED ALKALI SILICATE COMPOSITIONS FOR COATINGS AND CEMENTS

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 973,480, Dec. 26, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,299

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ C09D *1/02*

U.S. Cl. 106—74 **4 Claims**

1. A method for preparing an aqueous, curable silicate composition comprising the steps of:

a. reacting aluminum dihydrogen phosphate with an ammonia compound to form a reaction product;

b. heating said reaction product to a sufficient temperature for a sufficient time to produce predominantly the B-form of aluminum trimetaphosphate; and

c. adding said heat treated reaction product to a mixture consisting essentially of sodium silicate and potassium silicate in aqueous solution.

4,312,674
COMPOSITION AND METHOD OF PRODUCING INSOLUBLE MAG-OXY CEMENTS

Joseph P. Stalego, Newark, and Ernest E. Lawson, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 18,684, Mar. 8, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 176,629

Int. Cl.³ C04B *9/00*

U.S. Cl. 106—105 **57 Claims**

1. A magnesium oxide cement modified by having sufficient orthophosphate present and incorporated into its structure by heating at temperatures above approximately 250° F. so that it has a solubility of less than 2 percent in boiling water.

4,312,675
HIGH CONCENTRATION POLYMER SLURRIES

Patrick A. Pickens, San Diego; Thomas A. Lindroth, Spring Valley, and Robert D. Carico, Costa Mesa, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 23,511, Mar. 23, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,313

Int. Cl.³ C08J *3/02;* **C08L** *1/28, 5/00*

U.S. Cl. 106—171 **10 Claims**

1. A high concentration polymer slurry comprising 20–65 weight % of xanthan gum; 20–75 weight % hydrophobic solvent base which is insoluble in water, does not solvate or swell hydrophillic colloids, has a melting point of no more than 30° C., and has a vapor pressure at 20° C. of no more than 1 Torr; 0.05–0.25 weight % suspending agent; and optionally, 0.5–1 weight % thinning agent; and, optionally, 0.1–7.0 weight % dispersant, wherein said hydrophobic solvent base is one or more of:

1. aliphatics of the formulas C_nH_{2+2}, C_nH_{2n}, or C_nH_{n+1} wherein n is 6 or greater and mixtures thereof;
2. mineral spirits, and mixtures of aliphatics, ketones, aldehydes, esters, ethers, glycols, and alcohols;
3. vegetable oils;
4. mixtures of diesel oil or kerosene in about equal amounts with primary, secondary, and tertiary alcohols of 6–12 carbons;
5. turpentine;
6. glycol ethers;
7. glycols of formula weight greater than 1000;
8. 2,2,4-trimethylpentanediol-1,3-monoisobutyrite;
9. animal oils;
10. silicone oils; or
11. halogenated solvents.

4,312,676
RETRO-REFLECTIVE LIQUID COATING COMPOSITION

John M. Hogseth, and Melvin L. Johnson, both of St. Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 594,273, Jul. 9, 1975, abandoned, which is a continuation of Ser. No. 219,191, Jan. 19, 1972, abandoned, which is a continuation of Ser. No. 23,014, Mar. 26, 1970, abandoned. This application Aug. 26, 1977, Ser. No. 827,898

Int. Cl.³ C08K *5/05, 5/07;* **C08L** *1/26, 94/04*

U.S. Cl. 106—189 **9 Claims**

1. A coating composition useful, inter alia, to form mound-shaped retroreflective marks that rapidly actuate photoscanner sensing devices, the composition comprising

(1) a liquid vehicle that includes

(a) a volatile solvent that accounts for at least 90 volume-percent of the vehicle, and

(b) a gel agent that when mixed in an amount of less than about 10 volume parts per 100 parts of said solvent forms a gel that will support minute discrete retroreflective elements in a dispersed condition throughout the whole thickness of an applied mark of the gel, said gel agent being included in the vehicle in an amount sufficient to form such a gel and accounting for at least 50 volume-percent of all non-volatile binder material present in the vehicle; and

(2) minute discrete retroreflective elements, comprising transparent microspheres and associated specular light-reflecting means, suspended in the vehicle in an amount of at least 50 volume-percent of all non-volatile material in the composition;

whereby, the composition may be applied to a surface as a mound-shaped mark, and a portion of the retroreflective elements within the composition will be supported and become optically exposed at the mound-shaped exterior surface of the mark.

4,312,677
APPARATUS FOR SEPARATING THE COMPONENTS OF PLANT STALKS

Sydney E. Tilby, Victoria, and Branko Vukelic, Windsor, both of Canada, assignors to Intercane Systems, Inc., Windsor, Canada

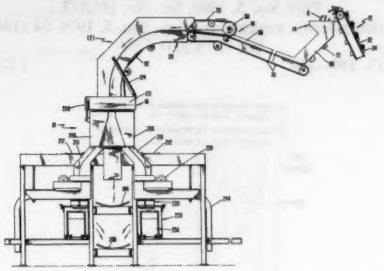
Filed Feb. 12, 1980, Ser. No. 120,773

Int. Cl.³ C13C *1/02*

U.S. Cl. 127—2 **15 Claims**

1. In a stalk separator of the type comprising stalk splitting

means, feeding means for advancing plant longitudinally oriented stalks longitudinally against cutting edge means of said splitter means to split the stalks longitudinally into sections, and means for removing at least a pith component from each stalk section, the improvement wherein said feeding means



comprises a pair of endless conveyors including mutually facing, parallel stalk gripping sections disposed on opposite sides of said splitter means, said gripping sections together defining a stalk-conveying nip extending at least as far as said cutting edge means so that the stalks are positively advanced through said cutting edge means.

4,312,678

EXTRACTION OF SUCROSE FROM MOLASSES

Arthur M. Landis, Carpentersville, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 3, 1980, Ser. No. 183,699
Int. Cl.[3] C13D *3/12, 1/00;* **B01J** *20/22*
U.S. Cl. 127—46.2 **10 Claims**

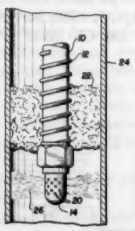
1. A process for separating sucrose from an aqueous mixture of a sugar source containing sucrose and at least one other sugar which comprises contacting said mixture at adsorbent conditions with an adsorbent comprising a shaped replication of inorganic support particle aggregates, said adsorbent consisting of a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms thereby selectively adsorbing said sucrose thereon and thereafter recovering said sucrose by separating a raffinate stream from the adsorbent, and desorbing the sucrose from the adsorbent.

4,312,679

METHOD FOR CLEANING CLOGGED PIPES

Richard W. Klein, Sr., 1201 S. Eads St., #212, Arlington, Va. 22202

Filed Mar. 27, 1978, Ser. No. 890,395
Int. Cl.[3] B08B *1/04, 3/02, 9/02*
U.S. Cl. 134—8 **2 Claims**



1. A method of cleaning a clogged pipe employing a device comprising:

(a) an elongated flexible tube;

(b) a heavy coil surrounding said flexible tube in close contact with the exterior surface thereof;

(c) a nozzle at one end of said flexible tube, said nozzle having a plurality of perforations which are in communication with the interior of said flexible tube and which are oriented radially of said flexible tube; and

(d) first means for connecting said flexible tube to a source of water, said first means being located at the other end of said flexible tube, said method comprising the steps of:

(1) forcing said nozzle through the material clogging the pipe;

(2) discharging water through the perforations in said nozzle after it has passed through the material clogging the pipe; and

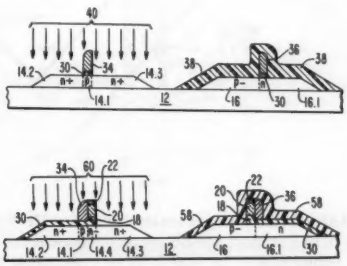
(3) pulling the nozzle backwards toward the material clogging the pipe while continuing to discharge water through the perforations in the nozzle.

4,312,680

METHOD OF MANUFACTURING SUBMICRON CHANNEL TRANSISTORS

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,157
Int. Cl.[3] H01L *21/225, 21/308, 29/78*
U.S. Cl. 148—1.5 **11 Claims**



1. An improved method of making a semiconductor device which includes forming a low resistivity conductive line from a layer of semiconductor material insulated from the surface of a semiconductor body of a given conductivity type, the line having a substantially submicron width produced by introducing an etch limiting element into the wider layer of semiconductive material by lateral diffusion to define a narrower doped region in the wider layer and then subjecting the wider layer to a selective etching solution to remove the undoped material of the wider layer to the exclusion of the doped material of the doped region, the improvement comprising:

depositing a first layer of insulating material on the surface of the semiconductor body;

forming a solid source of the etch limiting element on a portion of the surface of the first insulating layer;

depositing a second layer of insulating material on the solid source;

removing a portion of the solid source and first and second layers of insulating material from the surface of the semiconductor body to define and expose an edge on the solid source adjacent the desired location of one edge of the strip-shaped layer;

growing a gate insulating layer on the surface of the semiconductor body not covered by the solid source;

depositing the wider layer of the semiconductor material on the surface of the third insulating layer with a portion thereof in lateral contact with the exposed edge of the solid source; and

heating the device to laterally diffuse the etch limiting ele-

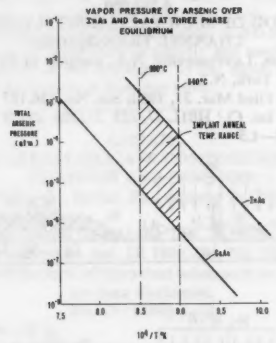
ment out of the solid source and into the wider layer at a given temperature and for a time sufficient to extend the doped region to a predetermined, relatively short distance from the edge of the solid source.

4,312,681

ANNEALING OF ION IMPLANTED III–V COMPOUNDS IN THE PRESENCE OF ANOTHER III–V COMPOUND HAVING HIGHER DISSOCIATION PRESSURE

Hans S. Rupprecht, Yorktown Heights, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1980, Ser. No. 142,916
Int. Cl.³ H01L *21/477*
U.S. Cl. 148—1.5 **18 Claims**



1. Method of annealing an ion implanted first III–V semiconductor of two or more constituents in the presence of a second III–V semiconductor of two or more constituents in which said second III–V semiconductor has a higher dissociation pressure than said first III–V semiconductor for reducing thermal decomposition and retaining stoichiometry therein during said annealing thereof.

4,312,682

METHOD OF HEAT TREATING NICKEL-BASE ALLOYS FOR USE AS CERAMIC KILN HARDWARE AND PRODUCT

Robert B. H. Herchenroeder, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Dec. 21, 1979, Ser. No. 106,304
Int. Cl.³ C22F *1/10*
U.S. Cl. 148—2 **5 Claims**

1. The method for producing a kiln hardware article for use in the manufacture of ceramic products including the steps of:

a. providing an alloy consisting essentially of, in weight percent, 8 to 25 chromium, 2.5 to 8 aluminum, a small but effective yttrium content not exceeding over 0.04, and the balance nickel and impurities plus modifying elements optionally selected from the groups: up to 15 total Mo, Rh, Hf, W, Ta and Cb; up to 0.5 total C, B, Mg, Zr and Ca; up to 1Si, up to 2Mn, up to 20Co, up to 5Ti, and up to 30Fe

b. fashioning said alloy into said article with a required shape for said use, and

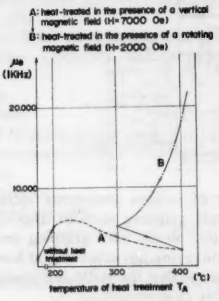
c. heat treating said fashioned article to provide a predominantly aluminum oxide film of the surface of said article.

4,312,683

METHOD FOR HEAT-TREATING AMORPHOUS ALLOY FILMS

Hiroshi Sakakima, Hirakata; Harufumi Senno, Yamatokoriyama; Yukihiro Yanagiuchi, Katano, and Eiichi Hirota, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1980, Ser. No. 184,323
Claims priority, application Japan, Sep. 5, 1979, 54-114643
Int. Cl.³ C21D *1/04*
U.S. Cl. 148—108 **4 Claims**



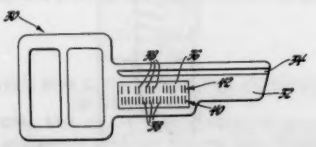
1. A method for heat-treating an amorphous alloy film, which comprises heating said amorphous alloy film at a temperature less than its Curie temperature and in the presence of a directed magnetic field whose direction is perpendicular to the surface of said amorphous alloy film, so as to suppress induced magnetic anisotropy in said amorphous alloy film.

4,312,684

SELECTIVE MAGNETIZATION OF MANGANESE-ALUMINUM ALLOYS

Andrew R. Chraplyvy, Troy, Mich.; John J. Croat, Sterling Height, and Jan F. Herbst, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1980, Ser. No. 138,239
Int. Cl.³ H01F *1/00*
U.S. Cl. 148—121 **8 Claims**

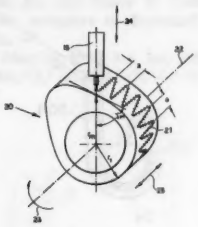


1. A nonmagnetic body formed of a manganese-aluminum based alloy comprising about 65–75 weight percent manganese and carrying magnetically readable information in the form of one or more integral regions of high magnetic coercivity.

4,312,685
SURFACE HARDENING OF CAMS OF MOTOR-VEHICLE CAMSHAFTS

Volker Riedl, Ingolstadt, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,300
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1978, 2839990
Int. Cl.³ C21D *9/30*
U.S. Cl. 148—146 **5 Claims**



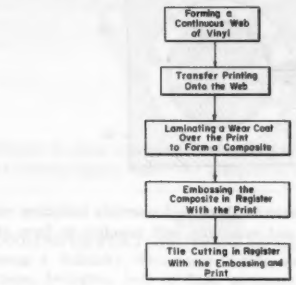
1. A method of surface-hardening an object having an axis and an eccentric surface, said method comprising the steps of:
rotating said object about said axis at an angular speed rate;
juxtaposing a torch-type heat source with and directing same radially at said surface;
displacing said heat source radially of said axis relative to said eccentric surface during rotation thereof to hold said heat source at a substantially fixed radial distance from said surface;
relatively axially reciprocating said heat source and said object during rotation thereof at a reciprocation rate so that said heat source heats said surface along an undulating path; and
varying one of said rates in such a manner that the pitch of said path remains substantially constant.

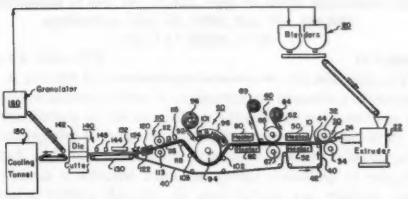
4,312,686
PRINTED AND EMBOSSED FLOOR COVERING AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Merrill M. Smith; Ernest R. Holmstrom, both of Morrisville, Pa., and Donald C. Ferguson, Trenton, N.J., assignors to American Biltrite Inc., Cambridge, Mass.

Filed Feb. 11, 1980, Ser. No. 120,536
Int. Cl.³ B32B *31/00*; B26D *5/00*; B31F *1/20*; D04H *1/00*
U.S. Cl. 156—209 **11 Claims**

1. A method of making, on a continuous basis, a composite vinyl tile comprising the steps of:
forming a continuous base web on a moving supported surface, said web being formed from a vinyl composition, said moving surface being made of a material such that the base web will adhere to the surface when the web is hot but can be removed from it when the web is cooled,
raising the temperature of said plastic web,
transferring a printed design from a pre-printed stable carrier sheet to the continuous base web after said web has been heated, said printed design being formed by a vinyl material compatible with said base web, said printed design including a first portion which constitutes a decorative design for the finished product and a second portion which provides registration indicia for use in the manufacture thereof,
laminating a clear plastic wear layer over the printed design on the hot base web,
after the web is laminated, aligning the web by means of the printed registration indicia so that the web is aligned with an embossing roll in both the direction transverse to the direction of travel of the web and the direction that is the same as the direction of travel of the web,
mechanically embossing the printed side of the base web with depressions in registration with the printed decorative design,
cooling the base web,
stripping the cooled web from the moving surface,
after it has been stripped from the moving surface, annealing the web to remove the strains imparted by laminating and embossing,


Forming a Continuous Web of Vinyl
Transfer Printing Onto the Web
Laminating a Wear Coat Over the Print to Form a Composite
Embossing the Composite in Register With the Print
Tile Cutting in Register With the Embossing and Print



aligning the annealed web by means of the printed registration indicia so that the web is aligned with a cutting tool in both the direction transverse to the direction of travel of the web and the direction that is the same as the direction of travel of the web,
cutting the continuous base web into discrete tiles so that the decorative design is in register with the edges of the tile, and
cooling the cut tiles.

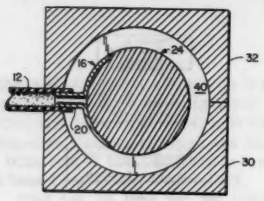
4,312,687
SOLAR COLLECTOR HEADERS

Harry W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 15, 1980, Ser. No. 216,576
Int. Cl.³ B29D *23/02, 3/00*
U.S. Cl. 156—245 **7 Claims**

1. A method for forming a hollow elongated header having plural radially disposed hollow pliant tubes, comprising:
fitting an end of each of said tubes around a mating one of plural hollow cylindrical elements projecting radially from the canvex side of a hollow, semi-cylindrical member; placing said member in abuttment with a generally cylindrical mandrel to form a generally cylindrical assem-

bly having plural radially projecting elements; disposing said assembly in a female mold with said tubes projecting through apertures in a wall of said mold; injection molding a hardenable elastomeric material in a cavity space between said female mold and said assembly;



hardening said material about said assembly including ends of said tubes and removing said mandrel to form said header.

4,312,688

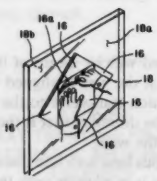
METHOD AND APPARATUS FOR MAKING SIMULATED STAINED-GLASS

Eric P. Brodis, 508 Richmond Rd., East Meadow, N.Y. 11554, and Anthony Ricca, 23 E. Webster St., Merrick, N.Y. 11566

Filed Feb. 11, 1980, Ser. No. 120,389

Int. Cl.³ B65D *69/00*; B44F *1/06*; B44C *5/08*

U.S. Cl. 156—63 **10 Claims**



1. A kit for constructing simulated stained-glass on an existing surface comprising at least one sheet of plastic, thin-film stock from which one or a plurality of individually sized pieces can be cut, lead stripping, a pressure-sensitive adhesive applied respectively to one face of said sheet of thin-film stock and to one face to said lead stripping, a removeable protective covering applied to the adhesively coated face of said sheet of thin film stock, a plurality of designs each having defined border lines and printed on substantially flat stock, said designs being used to facilitate the simulation of a given one of such designs in said lead stripping and individually size pieces, whereby when said lead stripping and individually sized pieces are attached to the existing surface, the adhesively coated face of said lead stripping and individually sized pieces adhere permanently to the surface and thereby simulate the look of stained-glass.

4,312,689

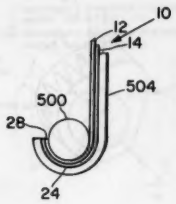
DISPENSING CONTAINER AND METHOD OF ASSEMBLING IT

John S. Amneus, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 889,460, Mar. 23, 1978, Pat. No. 4,163,509, which is a continuation-in-part of Ser. No. 836,117, Sep. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 770,533, Feb. 22, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,266

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—160 **6 Claims**



1. The method of constructing a self closing, pressure operable valve portion in a spout comprising separate, opposing walls of supple, imperforate film material, said method comprising the steps of placing said opposed walls in face-to-face contact, forming said valve portion over a curved surface and seaming said opposed walls together while said valve portion is held in said curved condition, whereby the seams thus formed maintain said walls in a curved conformation in the discharge direction when said valve portion is empty.

4,312,690

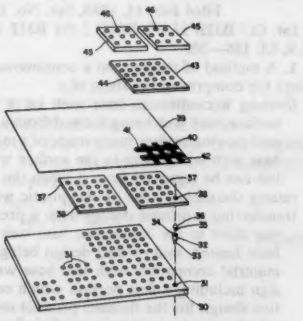
METHOD OF MAKING AIR CUSHION VEHICLE FLEXIBLE SKIRTS

Raymond L. Wheeler, Cowes, England, assignor to British Hovercraft Corporation, Yeovil, England

Division of Ser. No. 50,609, Jun. 21, 1979, Pat. No. 4,248,320, which is a continuation-in-part of Ser. No. 840,860, Oct. 11, 1977, abandoned. This application Jul. 24, 1980, Ser. No. 171,724

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—253 **4 Claims**



1. A method of manufacturing an apertured flexible sheet component for an air cushion vehicle flexible skirt, comprising laying up between two sheets of elastomeric material a layer of a reinforcing fabric having substantial spacings between groups of warp and weft cords, subjecting the assembly to heat and pressure so as to effect curing of the elastomeric material whereby the elastomeric material is embedded in the interstices between the cords and fills the spacings between said groups of

cords to form a homogeneous sheet of flexible material, cutting away elastomeric material at the locations of some of said spacings between the groups of warp and weft cords in said reinforcing fabric so as to form apertures in the elastomeric material within said spacings whereby no broken cords are caused by formation of the apertures.

4,312,691

SYSTEM FOR PREPARING IDENTIFICATION CARDS

Percy Rosenbloom, Jr., and Nancy P. Youngblood, both of Jacksonville, Fla., assignors to Technical Materials, Inc., Jacksonville, Fla.

Filed May 16, 1980, Ser. No. 150,300
Int. Cl.³ B32B *31/06, 31/18*
U.S. Cl. 156—267 **13 Claims**

1. A system for rapid preparation of an identification card containing a photograph of the subject comprising

(a.) photographing the subject with an automatic, rapid development camera having a viewfinder which includes focusing means to assure that the subject being photographed will appear in a predetermined off-center location in the developed photograph;

(b.) placing the developed photograph between the folded halves of a precut card having a single fold dividing the card into a front half and a back half, said front half having a precut aperture located such that the head of the subject in the photograph will be generally centered in the aperture when one edge of the photograph is positioned at said fold and said front half and said back half are closed on each other;

(c.) trimming the excess of said photograph which extends beyond the edges of said folded card; and

(d.) sealing said front half to said back half to produce a laminate.

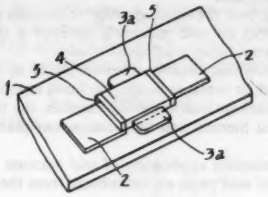
4,312,692

METHOD OF MOUNTING ELECTRONIC COMPONENTS

Junji Ikeda, Ikoma; Ryuzo Hochin, Kadoma, and Tamotsu Wakahata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 5, 1980, Ser. No. 127,392
Claims priority, application Japan, Mar. 9, 1979, 54-28101
Int. Cl.³ B29C *27/04*
U.S. Cl. 156—272 **8 Claims**

1. A method of mounting electronic components on a printed circuit board comprising the steps of temporarily attaching the electronic component to the circuit board with an adhesive, curing the adhesive by irradiating the adhesive with ultraviolet rays to rigidly attach the component to the board and soldering the resulting assembly, wherein when the component is held temporarily attached to the board, the adhesive has an excess portion extending outward from between the component and the board, and the excess portion of the adhesive is initially cured to thereafter cure the other portion of the



adhesive in chain relation to the curing of the excess portion and thereby rigidly attach the component to the board.

4,312,693

BONDING OF POLYURETHANE TO SILICONE RUBBER

George A. Salensky, Whitehouse Station, and Ronald A. Martineau, Irvington, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 15,422, Feb. 26, 1979, abandoned. This application May 30, 1980, Ser. No. 154,848
Int. Cl.³ B32B *27/40*
U.S. Cl. 156—272 **12 Claims**

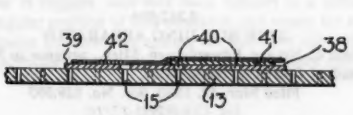
1. A process for producing a laminate by the adhesion of the surface of silicone rubber to polyurethane consisting of rendering the surface of silicone rubber adhesive to polyurethane by contacting the silicone rubber with a gas plasma for from 10 seconds to 20 minutes at subatmospheric pressure, wherein said gas plasma is selected from the group consisting of oxygen, nitrogen, carbon dioxide, air and helium gas plasmas, and, within about 60 minutes of the end of said contacting, bringing the silicone rubber in pressure contact with polyurethane whereby the polyurethane adheres to the silicone rubber.

4,312,694

METHOD FOR FACILITATING PRINTSHOP PASTE-UP OPERATIONS

Paul L. Sherman, and Kay Sherman, both of 5 Western Pl., East Brunswick, N.J. 08816

Continuation of Ser. No. 586,900, Jun. 16, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,604
Int. Cl.³ A45D *42/14;* B29C *17/00;* B32B *31/04, 31/24*
U.S. Cl. 156—286 **8 Claims**



1. The method of preparing printshop paste-ups that comprises:

(a) providing a vacuum table having in a top surface thereof a grid of closely spaced air passage apertures,

(b) arranging on said surface, while applying a vacuum causing air to be drawn downwardly through said aperture, a paste-up mounting member in the form of a sheet smaller than the apertured area of said table top having throughout its major portion a grid of apertures larger than and spaced to align with said air passage apertures and having an imperforated border of sufficient width to overlie two rows of said air passage apertures, then,

(c) while continuing to apply said vacuum, arranging bits and pieces of text and illustrative sheet material on the apertured portion of said mounting member for retention by the suction hold created at apertures thereby covered,

(d) rearranging said bits and pieces by lifting an individual bit or piece needing adjustment to break the suction hold and replacing the same until desired composition is achieved, then

(e) placing over the subassemblage of vacuum supported bits and pieces on said mounting member a sheet of clear, transparent latently adherent plastic,

(f) activating said latently adherent plastic by application of heat and/or pressure to thereby bond together as a paste-up assemblage said mounting member, the bits and pieces arranged thereon and said transparent plastic sheet, and then

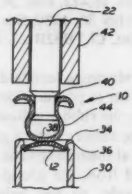
(g) discontinuing application of said vacuum to permit removal of said paste-up assemblage from the table.

4,312,695

METHOD AND APPARATUS FOR EVERTING A CLOSURE AND SEPARATING A LINER THEREFROM

W. Coy Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 25, 1980, Ser. No. 143,743
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—344 **10 Claims**



1. A method for separating a liner from a metal closure having a cylindrical skirt and a top end wall having an exterior surface and an interior surface against which a liner is disposed, comprising:

supporting the closure;

pressing against the exterior surface of the top end wall with pressing means to at least partially evert the closure;

reforming the everted closure against the pressing means to temporarily couple the closure with the pressing means;

retaining the liner in support means;

separating the liner from the closure; and

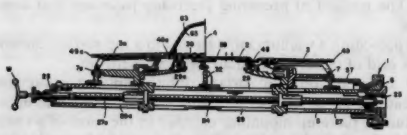
stripping the partially everted closure from the pressing means.

4,312,696

TIRE BUILDING APPARATUS

Emerson C. Bryant, Edwardsburg, Mich., assignor to National-Standard Company, Niles, Mich.

Filed Mar. 12, 1980, Ser. No. 129,595
Int. Cl.³ B29H *17/16*
U.S. Cl. 156—415 **21 Claims**



1. A tire building apparatus including in combination;

an elongated shaft,

an air-pervious intermediate cylindrical-shaped supporting means mounted on said shaft in surrounding relation thereto to permit passage of air outwardly therethrough,

two end supporting means disposed around said shaft on respective opposite sides of said intermediate supporting means, said end supporting means having outer peripheral surfaces for support of the tire carcass components thereon and bead lock clamp means movable radially outwardly to clamp said tire carcass material to the tire beads, wherein in one position said outer peripheral surfaces are disposed in substantially axially aligned relation to the outer peripheral surface of said intermediate cylindrical-shaped supporting means to support said tire carcass material therearound,

carrier means mounted on said shaft and operatively connected to said end supporting means, said carrier means being movable relative to said shaft for mounting or demounting said tire carcass material while in the axially outward position and for disposing said bead lock clamp means in position to support said beads in the position of the beads of a finished tire while in an axially inward position, and

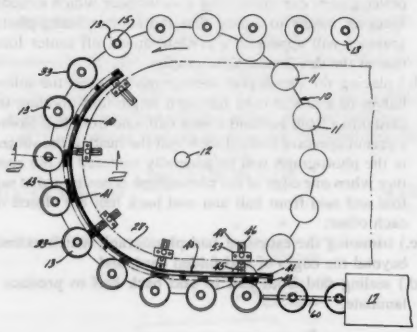
means for feeding air under pressure into said intermediate cylindrical-shaped supporting means for passage outwardly therethrough into contact with said tire carcass material disposed therearound, simultaneously with said moving of said end supporting means inwardly towards one another, to thereby move the carcass material substantially radially outwardly away from said intermediate cylindrical-shaped supporting means into an expanded position.

4,312,697

BRUSH ASSEMBLY HOLDING SLEEVES POSITIONED ON A CONTAINER

Marshall G. Brummett, Toledo, Ohio, assignor to Owens-Illinois, Inc., Ohio

Filed Apr. 21, 1978, Ser. No. 898,358
Int. Cl.³ B65C *3/08*
U.S. Cl. 156—423 **4 Claims**



1. In an apparatus for telescopically assembling hollow sleeves of heat contractable thermoplastic relatively loosely on articles at an assembly station and transferring the articles with said sleeves in assembled position to a heating device for contracting the sleeves in place on the articles by heat, said apparatus including a conveyor means supporting a plurality of the articles in spaced relation for movement in a path including the assembly station to receive said sleeves in their said assembled position and through said heating device, the improvement therein comprising:

a longitudinally elongated brush assembly having flexible bristle-like elements projecting therefrom, said assembly being shaped longitudinally to a contour that corresponds substantially with the portion of said path for said articles extending from the assembly station to the proximity of the heating device, and

means supporting said brush assembly along said portion of the path of the articles and locating the said bristle-like elements thereof with respect to the articles for engaging

the plastic sleeves in assembled position thereon, said brushing engagement holding said sleeves in said assembled position during movement along said brush assembly.

4,312,698

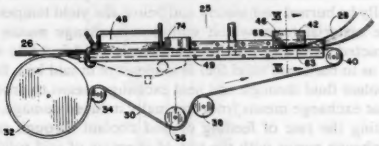
FIBROUS ROD FORMING DEVICE

Alex S. Gergely, Powhatan, Va., assignor to Philip Morris, Inc., New York, N.Y.

Filed Jan. 11, 1980, Ser. No. 111,503

Int. Cl.³ D04H *3/00*

U.S. Cl. 156—441 3 Claims



1. An apparatus for making a stable elongated element of tow from a continuously fed metered supply of fibrous or particulate matter or a combination of the both wherein bonding of the matter is activated by heating and wherein the tow element is subsequently rigidified by cooling, said apparatus including:

a. an endless, flexible belt with longitudinal edges adapted to form a butt joint:

b. means for moving the belt through a continuous orbit;

c. means for feeding the tow onto the belt during a portion of its orbit and wrapping said belt about said tow to encase said tow and form a butt joint where the edges of said belt meet;

d. means for forming the tow into a predetermined shape;

e. means for heating the tow while moving with and encased within said belt while said belt and tow are maintained in predetermined shape to thereby initiate bonding of the fibrous or particulate matter together;

f. means for cooling the tow while the belt is moving and encasing the tow in predetermined shape to thereby rigidify the tow and form the same into a stable continuous element of the predetermined shape; and

g. means for separating the stable continuous element from the longitudinal edges of the belt adjacent the longitudinal edges thereof comprising a ridge remover element with longitudinal walls forming guide grooves for receiving said belt edges and serving as a positive guide for said belt edges;

1. said ridge remover supported in said linear portions of the orbital paths of the belt having a substantially T shaped element extending between the longitudinal edge portions of the belt, said ridge remover having a tow contacting surface curved in the transverse direction to the direction of travel of said tow substantially to the curvature of surface desired to be imparted to the surface of said tow for smoothing that portion of the tow formed longitudinally on said tow at the juncture of said belt edges and a stem portion of said substantially T-shaped element extending outwardly of said belts, said portion having said guide grooves in opposite said longitudinal walls thereof reducing thickness of said portion.

4,312,699

APPARATUS FOR ATTACHING ADHESIVE-COATED SHEETS TO CIGARETTE PACKS OR THE LIKE

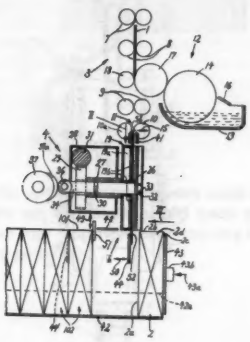
Otto Erdmann, Hamburg, and Reinhard Deutsch, Geesthacht, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. K.G., Hamburg, Fed. Rep. of Germany

Filed Jan. 7, 1980, Ser. No. 109,921

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901825

Int. Cl.³ B65C *9/36*

U.S. Cl. 156—477 R 20 Claims



1. In an apparatus for attaching flexible sheets of the type having adherent and non-adherent sides and first and second end portions to block-shaped commodities, particularly for applying labels to packs of cigarettes or the like, the combination of means defining a station for attachment of successive sheets to successive commodities; means for feeding successive sheets toward but short of said station; means for transferring successive sheets from said feeding means to successive commodities at said station, including carrier means which leaves exposed both sides of the first end portin of each sheet which is being transferred to said station; a back support disposed at said station and adjacent to the non-adherent side of said first end portion of the sheet which is delivered by said transferring means, said carrier means comprising a turntable indexible about a predetermined axis and having at least one receiving means for sheets, said receiving means being positioned to receive a sheet from said feeding means in a first angular position of said turntable and to maintain the first end portion of such sheet in register with said back support in a different second angular position of said turntable; and means for moving successive commodities against the adherent sides of the first end portions of sheets abutting against said back support.

4,312,700

METHOD FOR MAKING SILICON RODS

Dieter Helmreich, Burghausen; Erhard Sirtl, Marktl, and Theo Zöllner, Burghausen, all of Fed. Rep. of Germany, assignors to Helictronic Forschungs- und Entwicklungs- Gesellschaft fur Solarzellen-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,707

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925679

Int. Cl.³ C30B *11/08, 29/06, 35/00*

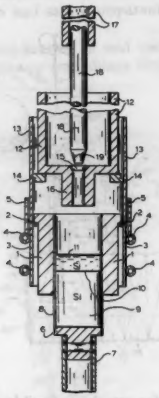
U.S. Cl. 156—616 R 8 Claims

1. A method for making silicon rods having a columnar structure made of monocrystalline crystal zones having a preferential crystallographic orientation, comprising the steps of:

feeding silicon from a silicon reservoir into a crystallization chamber having an interior horizontal dimension corresponding to at least to the cross-sectional dimension of the

rod to be made and having a vertically movable support base on which said silicon fed to said chamber rests;

providing an intermediate protective melt between the silicon and the inner wall of said crystallization chamber so as to avoid direct contact therebetween, said protective melt being made of alkaline earth fluorides in an admixture with 30 to 90 mole percent alkaline earth silicates, said protective melt having a melting point below the melting point of silicon; and



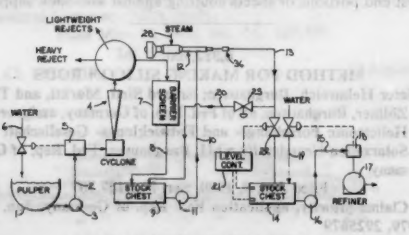
effecting the solidification of said silicon in said crystallization chamber by subjecting the same to a vertical temperature gradient which produces an oriented crystal growth in the solidifying silicon, said silicon being fed to said chamber in such a quantity that a molten deposit is maintained above the solidifying silicon during its crystal growth under the influence of said temperature gradient, the weight quantity of said molten deposit being maintained at 0.1 to 5 times that of the silicon which crystallizes in a downward direction per minute.

4,312,701

METHOD FOR DEFIBRATING WASTE PAPER AND DISPERSING CONTAMINANTS

Robert Campbell, Milwaukee, Wis., assignor to Hydro-Thermal Corporation, Milwaukee, Wis.

Filed Nov. 7, 1980, Ser. No. 204,942
Int. Cl.³ D21C *5/02*
U.S. Cl. 162—4 **8 Claims**



1. A method of defibrating waste paper and dispersing contained contaminants within the dispersed fibers, comprising the steps of contacting an aqueous stock of waste paper having a fibrous solids content of 1% to 5% by weight with steam at a pressure in excess of 20 psig and at a velocity of 1,200 to 1,600 ft./sec. to provide a steam-stock mixture, and flowing the mixture through a mixing tube under highly turbulent conditions to thereby heat the stock, separate the fibers of the stock and disperse any contained contaminants.

4,312,702

FLUIDIZED BED START UP AND OPERATION

George H. Tomlinson, II, Ile Perrot, Canada, assignor to Domtar Inc., Montreal, Canada

Filed May 6, 1980, Ser. No. 147,058
Int. Cl.³ D21C *11/12*
U.S. Cl. 162—30 R **7 Claims**

1. A method of starting-up and operating a fluidized bed recovery unit for generating steam and recovering waste chemicals from residual liquor produced in a pulp mill, said bed containing indirect heat exchange means said method comprising; blowing air upward through said bed so as to fluidize said bed, said bed being comprised of pellets formed from inorganic materials from said residual liquor, preheating said air to initially raise the temperature of said bed to a first temperature above a temperature at which a particulate ligno-cellulose solid fuel compatible with said pellets will substantially be burned completely and below the yield temperature of the material from which said heat exchange means is constructed, injecting said ligno-cellulosic solid fuel into said bed so as to burn said solid fuel in suspension in said bed, feeding a coolant fluid through said heat exchange means to protect said heat exchange means from thermally induced damage, coordinating the rate of feeding of said coolant through said heat exchange means with the rate of injection of said solid fuel to further increase the temperature of said bed to at least a second temperature at which concentrated residual liquor from said pulp mill may be burned without the build-up of carbon in said bed but below a temperature at which said pellets will agglomerate while maintaining the temperature of the heat exchange means below the said yield temperature injecting said residual liquor in concentrated form as a further fuel into said bed so as to burn organic material in said residual liquor, continuing to inject at least one of said fuels and controlling the rate of fuel injection to operate said bed at a bed operating temperature while simultaneously maintaining a rate of addition of coolant to said heat exchange means to ensure that the temperature of said heat exchange means does not exceed said yield temperature.

4,312,703

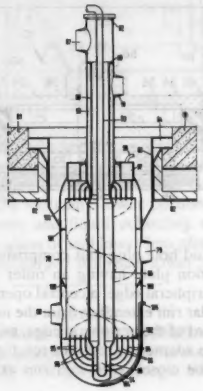
NUCLEAR REACTOR INSTALLATION

Nico Woudstra, Gouda, Netherlands, assignor to B. V. Neratoom, The Hague, Netherlands

Filed May 12, 1978, Ser. No. 905,516
Claims priority, application Netherlands, May 13, 1977, 5332
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—299 **1 Claim**

1. A nuclear reactor installation comprising a housing containing a reactor core and provided with means for dissipating the heat generated in the reactor core during power operation, which means comprise at least one primary fluid circuit incorporating a pump and extending through the reactor core, and at least one secondary fluid circuit for heat utilization arranged outside the reactor housing to utilize the heat from said core, said secondary circuit incorporating a pump and coupled for heat transfer to said primary circuit by means of an intermediate heat exchanger; wherein said installation is provided with further means for dissipating the decay heat produced in the core of the nuclear reactor after the reactor operation has been switched off and the power shut down, said further means comprising a third fluid circuit arranged outside the reactor housing, and said third fluid circuit comprising a pump means, said third fluid circuit being coupled to the primary circuit by said intermediate heat exchanger, said intermediate heat exchanger being structurally integrated to comprise a single vessel housing containing conducting and heat transfer members respectively forming part of the secondary circuit and the third fluid circuit and arranged at substantially the same loca-

tion in the flow path of the fluid in the primary circuit so that the said primary fluid flows substantially simultaneously over the conducting members of both the secondary utilization circuit and the third decay heat fluid circuit, and wherein said intermediate integrated heat exchanger situated outside of the reactor core comprises a vessel which accommodates the external portion of the primary circuit including the primary fluid containing the heat to be dissipated from the core during the power and decay phases of reactor operation and also accommodates heat exchange portions of said secondary fluid circuit and said third fluid circuit one of said portions forming a utilization circuit for absorbing the heat evolved during the power generation phase and the other of said portions forming



a decay heat circuit for absorbing the heat generated during the decay phase; each of said circuits comprising a heat-transporting fluid, fluid distribution chambers, heat exchange tubes connected at the proximate ends of said chambers, fluid collectors connected to the distal ends of said tubes and to heat utilization or cooler means outside of the heat exchanger vessel; said tubes from each said portions being combined into a tube bundle in heat exchange contact with said primary fluid to remove the heat therefrom, said tubes in said bundle being disposed in parallel relationship to each other and arranged so that said tubes from said decay heat circuit are positioned at the outer portions of said bundle and the tubes from said utilization circuit form the inner portion of the bundle.

4,312,704

SHUT-OFF DEVICE BLOCKING SPONTANEOUS PASSAGE OF SPHERICAL BULK MATERIAL ESPECIALLY IN QUICK EMPTYING PIPES OF PEBBLE BED REACTORS

Horst Schrör, Moers, and Gert-Michael Spindler, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,259

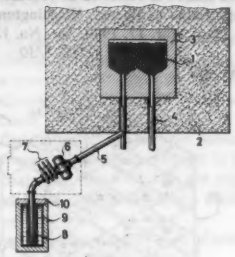
Int. Cl.³ G21C *3/56*; P03C *9/00*

U.S. Cl. 376—265 **20 Claims**

1. A releasable shut-off device for a downward leading quick emptying conduit for bulk material in the form of solid particles having a predetermined minimum cross-sectional dimension, comprising:

a pair of interfitting rod combs **(14,18)** mounted so as to be individually movable in and out of the conduit cross-section, and equipped with structural means for moving the rods of the comb in unison, said combs being constituted and disposed so as to form, complementarily, a load-carrying wall perpendicular to the axis of said conduit in the closed position of said combs, the gaps between the rods **(13,17)** of each individual comb **(14,18)** having in every case a width less than said minimum cross-sectional dimension of said particles; and

means for individually actuating the rod-moving means of each of said combs **(14,18)**, whereby the readiness of the



device may be verified by moving each comb alone to its open position and back and whereby quick emptying of said container may be performed by moving both combs to their open positions.

4,312,705

SPACER FOR NUCLEAR REACTOR FUEL ASSEMBLIES

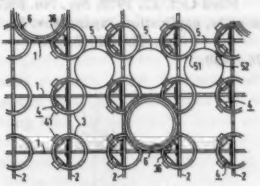
Alexander Steinke, Ebermannstadt, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Feb. 12, 1980, Ser. No. 120,743

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905661

Int. Cl.³ G21C *3/30*

U.S. Cl. 376—441 **5 Claims**

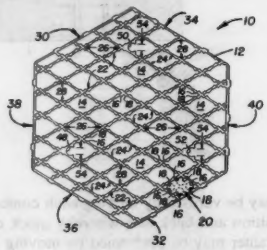


1. Spacer for fuel rods assembled into a fuel assembly for nuclear reactors formed of a grid structure of sheetmetal webs passing edgewise perpendicularly through one another comprising resilient and rigid contact elements fastened to the sheetmetal webs, each of the fuel rods being supportable in a respective mesh of the grid structure by two diagonally opposing three-point contact systems, each of said systems being formed of one of said resilient contact elements and two of said rigid contact elements disposed diagonally opposite and axially spaced from said one resilient contact elements, said one resilient contact element being disposed centrally of said two rigid contact elements, as viewed in axial direction, and said two rigid contact elements being disposed opposite one another in said axial direction and being ring-shaped.

4,312,706
SPACER GRID ASSEMBLY AND LOCKING MECHANISM

Harold J. Snyder, Jr., Rancho Santa Fe; Anthony R. Veca, and Harry A. Donck, both of San Diego, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 17, 1980, Ser. No. 130,995
Int. Cl.³ G21C 3/30
U.S. Cl. 376—442 22 Claims



1. A spacer grid assemby for retaining a plurality of fuel rods in substantially parallel spaced relation, comprising a plurality of spacer grids spaced-apart along the length of the fuel rods, each spacer grid defining a multiplicity of rhombic openings for receiving from one to four fuel rods, each opening having at least one acute angle and at least one obtuse angle, each opening including a pair of contact means for respectively engaging each fuel rod arranged in said opening, a pair of said contact means being located at each of said acute and obtuse angles, each pair of contact means being arranged for engagement with the respective fuel rods in approximately ninety degree spaced-apart relation, the rhombic openings of adjacent spacer grids being relatively offset with their contact points being arranged for engagement with each fuel rod in opposed relation, means for maintaining the spacer grids in spaced-apart relation, and means for preventing relative rotation of the spacer grids.

4,312,707
NUCLEAR FUEL ROD

Tatsuo Miyazawa, Urayasu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

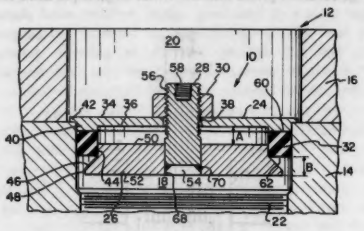
Filed Oct. 22, 1979, Ser. No. 86,798
Claims priority, application Japan, Nov. 13, 1978, 53/138895
Int. Cl.³ G21C 3/10
U.S. Cl. 376—450 8 Claims

1. A nuclear fuel rod, which comprises:
a cladding tube filled with an insert gas or liquid metal and sealed at both ends in airtightness; and
a plurality of nuclear fuel pellets piled one atop another in the cladding tube, wherein an adsorbent carrying a tag gas for monitoring a nuclear fuel rod failure is received in the inner space of the cladding tube defined at least above or below the nuclear fuel pellet pile whereby said gas or liquid metal is released from said adsorbent when the temperature thereof increases.

4,312,708
REACTOR STUD HOLE PLUG UNIT

Bruce E. Leslie, Baden, Pa., assignor to Thaxton, Inc., Gibsonia, Pa.

Filed Mar. 5, 1979, Ser. No. 17,452
Int. Cl.³ G21C 13/06
U.S. Cl. 376—203 8 Claims



1. A reactor stud hole plug unit comprising:
A. a compression plate having an outer surface, an inner surface, a peripheral edge, a central opening therethrough and an annular rim extending from the inward surface and spaced inward of the peripheral edge, said peripheral edge defining a lip adapted to rest on a reactor surface about an opening to be closed with said rim extending into said opening;
B. a mandrel having a central threaded stud extending outward therefrom through the compression plate central opening, said mandrel plate having a cylindrical upper section dimensioned to fit within said annular rim, a cylindrical lower section of larger diameter than the upper section and a frustoconical section connecting the upper and lower sections;
C. an elastomeric seal ring having a rectangular cross section and dimensioned to snugly fit about the cylindrical upper section of the mandrel plate and engage the compression plate rim in aligned relationship; and
D. a nut threadably engaging the stud so as to maintain the unit in assembled relationship and upon turning adapted to draw the mandrel plate toward the compression plate between a noncompressed state where the compression plate is spaced from the mandrel and a compressed state where the seal ring substantially fills a space defined by the annular rim, the mandrel and a wall of the opening being plugged.

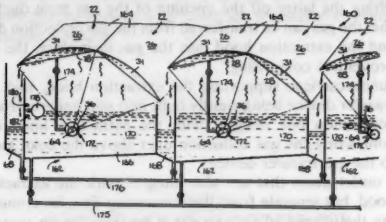
4,312,709
SOLAR ENERGY COLLECTION STILL

Virgil Stark, New York, N.Y.; Alexandre Vayda, Lausanne, Switzerland, and Paul Rousset, Cannes, France, assignors to North American Utility Construction Corp., New York, N.Y.

Division of Ser. No. 746,065, Nov. 30, 1976, Pat. No. 4,134,393.
This application Dec. 30, 1977, Ser. No. 866,067
Claims priority, application France, Jul. 9, 1976, 76 20986; Oct. 8, 1976, 76 30248
Int. Cl.³ C02F 1/14
U.S. Cl. 202—83 15 Claims

1. Apparatus for distilling liquids including water using solar energy, comprising container means for holding liquid to be distilled, an elongated fluid lens for concentrating solar energy in said container means, said fluid lens having upper and lower solar energy-transmitting lens plates and a solar energy-transmitting fluid enclosed by said lens plates and means for admitting fluid to and withdrawing fluid from said fluid lens such that said fluid can be passed through said fluid lens, said fluid

lens being disposed above said container means and positioned such that rising evaporated liquid from said container means impinges upon said lower lens plate and is condensed thereon, said lower lens plate being operative to transmit at least in part the heat of condensation released by evaporated liquid condensing thereon to said fluid in said lens, and said fluid being



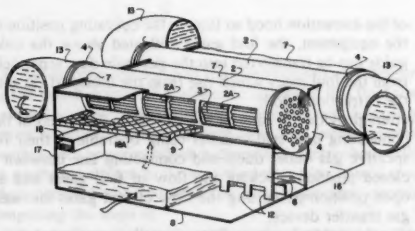
operative to absorb at least in part the heat transmitted by said lower lens plate, said fluid lens being inclined with respect to the horizontal such that condensed liquid flows along said lower lens plate to a vertically lower portion thereof and is discharged therefrom, and liquid collecting means disposed below said lower portion of said lower lens plate for collecting condensed liquid discharged from said lower portion.

4,312,710

MULTISTAGE FLASH EVAPORATOR

Kazuhiro Tanaka, Koganei, and Yutaka Maekawa, Chofu, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 21, 1980, Ser. No. 113,599
Claims priority, application Japan, Jan. 26, 1979, 54/8467[U]
Int. Cl.³ C02F *1/06*
U.S. Cl. 202—173 **3 Claims**



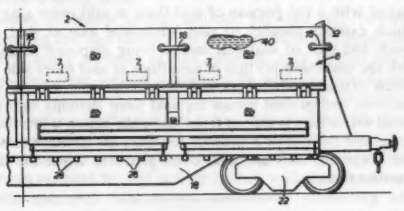
1. A multistage flash evaporator comprising:
a front wall;
a back wall spaced from said front wall;
a bottom wall connected to the front and back walls defining a space;
a plurality of parallel spaced cylindrical shells extending horizontally through said front and back walls, each having a steam intake opening on one side thereof and a steam output opening on another side thereof;
a tube sheet connected to each opposite end of each of said shells;
a plurality of cooling tubes connected between each tube sheet of each shell for receiving a flow of cooling medium flowing in a cooling medium flow direction;
a top wall connected between adjacent shells above said openings of each shell;
a water chamber member connected between adjacent ends of adjacent shells, with one end of each shell connected to an upstream shell and an opposite end connected to a downstream shell in the flow direction of the cooling medium with an upstream-most water chamber forming a cooling medium inlet and a downstream-most water chamber forming a cooling medium outlet;
a vertically extending bulkhead connected to each shell on an axial line on a lower outer surface of each shell, to said bottom wall and to said front and back walls dividing the space into a plurality of flash chambers in series;
a demister connected to adjacent shells below said openings thereof defining an upper part of each flash chamber;
said bulkheads defining passages between adjacent flash chambers for the movement of a liquid to be flash evaporated between adjacent flash chambers in said series, in a liquid flow direction;
an upstream-most flash chamber in said series having a liquid inlet and a downstream-most flash chamber in said series having a liquid outlet for liquid that has not evaporated;
a lower part of each of said shells defining a distillate tray; and
distillate recovery means connected to each of said trays for collecting and discharging the distillate.

4,312,711

FLUID COOLED QUENCHING CARS

Arthur Brown, and Kevin F. Murray, both of Keighley, England, assignors to Norcros Investments Limited, England

Filed Dec. 5, 1979, Ser. No. 100,553
Claims priority, application United Kingdom, Dec. 5, 1978, 47266/78
Int. Cl.³ B61D *3/16, 7/08, 7/28;* C10B *39/14*
U.S. Cl. 202—227 **2 Claims**



1. In a quenching car, an open-topped body arranged to carry a load to be quenched, said body comprising opposed end walls, a front side wall, a rear side, and an inclined bottom which slopes downwardly from the top of the body at the rear side to the bottom of the body at the front side wall,
the end walls and at least part of the front side wall being hollow, enabling said walls to hold a liquid cooling medium, said hollow walls being comprised of inner and outer plate-like layers separated by reinforcing members which lie in the interior of the hollow walls,
an open-topped water-receiving trough mounted on the car adjacent each end wall of the car, each trough being in communication with the interior of the adjacent hollow end wall, and
the interior of the two end walls being in communication with the interior of the hollow part of the front wall, whereby the hollow walls can be filled with cooling water via the troughs.

2. In a quenching car, an open-topped body arranged to carry a load to be quenched, trucks, and at least one girder of box-section that extends longitudinally of the car and supports said body on said trucks, said girder being of welded construction and comprising an upper wall, side walls, and a bottom wall, said upper wall overhanging the side walls, and said bottom wall being maintained within said side walls.

4,312,712
COKE CAR FOR A BATTERY OF COKE OVENS

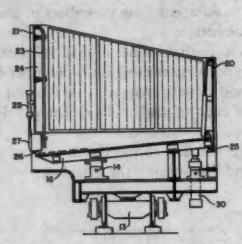
Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,167

Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2919956

Int. Cl.³ C10B *39/04, 39/14*

U.S. Cl. 202—229 **7 Claims**



1. A coke car to travel along a battery of coke ovens and a coke bench for receiving carbonized coke when stationary from an oven chamber for moving to beneath a quenching tower, said battery of coke ovens having an oven platform at the coke discharge side thereof, said car including a generally square box-like container having stationary inner and outer side walls with a seal means at the bottoms thereof, a floor adapted to bear against said seal means through pivotal movement about a single horizontal axis extending in the direction of travel by the car so that pivoting said floor into a swung-up position permits quenched coke to fall onto said coke bench at only one side thereof, part of said seal means being disposed to engage with a top portion of said floor at said outer side wall which extends parallel to said horizontal axis at said coke bench and part of said seal means being disposed to engage with the underside portion of said floor at said inner side wall which extends parallel to said horizontal axis at said oven platform, and pivotal means for said floor defining said horizontal axis which is spaced from said coke bench when the car is opposite thereto by a distance less than the distance between said horizontal axis and said oven platform when the car is opposite thereto.

4,312,713
COKE OVEN GAS EXTRACTION EQUIPMENT

Georg Mayer, Ratingen; Horst Schröter, Viersen, and Helmut Laux, Meerbusch, all of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,612

Int. Cl.³ C10B *27/00, 27/04*

U.S. Cl. 202—263 **3 Claims**

1. In equipment for collecting, extracting and purifying gases from the coke side of a battery of coke oven chambers with vertical flues and having

a track which runs on the gas gallery along the oven chambers and on which a coke guide car can travel, the coke guide of which is adjustable on the coke guide car transversely to the direction of motion thereof in the longitudinal direction of the oven chambers;

a gas collection duct above and connected to the coke guide;

a transport car which can travel along the oven chambers;

an extraction hood which reaches over the loading zone of the transport car, which can travel along the oven chambers, which is provided with a lateral passage opening sealable from the coke guide, and which is adapted to be connected to the gas collection duct when the fully carbonized coke cake is pushed into the transport car;

a stationary gas extraction and purification device;

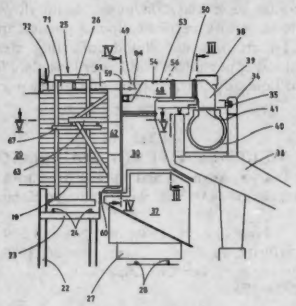
a gas main duct arranged parallel to the battery of coke oven chambers and connected to the gas extraction and purification device, the gas main duct having a longitudinally extending opening covered by an elastic cover belt which can be lifted off the opening of the gas main duct; and

a gas transfer device which is connected to the gas collection duct and extraction hood and which is movable above the gas main duct and below the cover belt for the purpose of lifting the latter off the opening of the gas main duct so that the gas can be transferred from the gas collection duct and the extraction hood into the gas main duct, the improvement comprising:

an undercarriage supporting the extraction hood, said gas transfer device being rigidly built into said undercarriage;

a connection line integral with the extraction hood and connecting the gas collection duct above the coke guide to the gas transfer device;

gas outlet ducts that are also integral with the extraction hood, but separate from the connecting line, for connecting the interior of the extraction hood to the gas transfer device, said gas transfer device being joined rigidly and gas-tight to the connecting line and to the gas outlet ducts



of the extraction hood so that, in the operating position of the equipment, the foul gases collected above the coke guide can be transferred into the gas main duct separately from the foul gases which rise from the transport car into the extraction hood;

shutters provided in each of the gas outlet ducts and in the connecting line, said shutters being operable in their respective gas outlet ducts and connecting line between a closed position blocking the flow of foul gases and an open position permitting the flow of foul gases into said gas transfer device;

said coke guide being at least partially surrounded by a sealing frame which is of telescopic design and can be moved toward and away from the extraction hood parallel to the main axis of the coke guide;

a drive mechanism for moving the sealing frame;

means for opening the shutters in the gas outlet ducts and in the connecting line when the sealing frame moves towards the extraction hood; and

gas coolers provided in the zone of the gas transfer device downstream of the gas outlet duct shutters.

4,312,714
DECREASING 3-BROMO-2-BUTANONE CONTENT OF ACETIC ACID

Jon J. Harper, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 17, 1979, Ser. No. 104,089

Int. Cl.³ C07C *51/21, 51/44*

U.S. Cl. 203—28 **2 Claims**

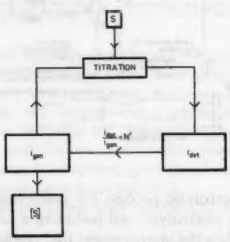
1. A method of decreasing the 3-bromo-2-butanone content of acetic acid obtained by the oxidation of liquid n-butane with oxygen gas at a temperature of from 120° C. up to 235° C. in

the presence of an acetic acid solution containing the bromide ion in combination with ions of cobalt or cobalt and manganese followed by withdrawing fluid oxidation effluent from said oxidation, removing unreacted n-butane from the fluid effluent and distilling acetic acid from the debutanized effluent; which 3-bromo-2-butanone decreasing method comprises holding at a temperature of from 150° C. up to 200° C. for from 15 up to 150 minutes the withdrawn fluid oxidation effluent after removing unreacted n-butane.

4,312,715
METHOD AND AN APPARATUS FOR ELECTROCHEMICAL ANALYSIS

John Albery, Flat 8, Queens Garden, London W2 3AS, and Peter Wood, 3 Manor Pl., Holy Well, Oxford, both of England

Continuation of Ser. No. 123,041, Feb. 20, 1980, abandoned. This application Dec. 29, 1980, Ser. No. 220,285
Claims priority, application Sweden, Feb. 26, 1979, 7901682
Int. Cl.³ G01N 27/44
U.S. Cl. 204—1 T 9 Claims



1. An autotitration method for electrochemically determining the concentration of a substance contained in a fluid that is arranged to flow past a generator electrode and downstream thereof a detector electrode, said substance being capable of reacting with a species which is generated electrochemically at the generator electrode, the non-reacted portion of said species being detected electrochemically at the detector electrode, comprising the steps of

(a) controlling the generator electrode current in response to the ratio between the detector electrode current and the generator electrode current so as to maintain said ratio at a constant value,

(b) measuring either of said currents which is a function of the concentration of the substance to be determined.

7. A device for electrochemically determining the concentration of a substance contained in a fluid, said device comprising in combination:

(a) a generator electrode adapted to contact said fluid and arranged to electrochemically generate a species capable of reacting with said substance,

(b) a detector electrode adapted to contact said fluid and arranged to detect said species electrochemically,

(c) means for establishing a flow of said fluid from said generator electrode to said detector electrode,

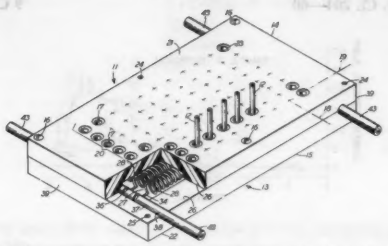
(d) means for determining the ratio between the detector electrode current and the generator electrode current and controlling the generator electrode current such that said ratio is kept at a constant value, and

(e) means for indicating either of the detector electrode current and the generator electrode current.

4,312,716
SUPPORTING AN ARRAY OF ELONGATE ARTICLES

Francis S. Maschler, Kansas City, and Gary A. Seifert, Lee's Summit, both of Mo., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Nov. 21, 1980, Ser. No. 209,079
Int. Cl.³ C25D 5/02, 17/06
U.S. Cl. 204—15 4 Claims



1. A holder for electrolytically treating ends of a plurality of elongate articles comprising:

a planar housing having a central space extending between upper and lower major surfaces thereof;

a plurality of arrayed guide apertures extending in vertical orientation to said upper and lower major surfaces through the housing;

an electrically conductive rod mounted at each of two opposite ends of said housing, said rods being positioned between, and in a plane parallel to, said upper and lower surfaces, said rods extending laterally from said housing as lateral supports for the housing; and

a plurality of tension springs mounted between said rods and extending through said central space between said upper and lower major surfaces of said housing, said springs being restrained from vertical movement by inner portions of said housing, said springs extending into laterally interfering relationship with the vertical projections of said guide apertures, whereby the elongate articles inserted into said guide apertures and into resiliently yielding contact with said springs are held by said springs against wall portions of said guide apertures, said springs electrically contacting said articles to the laterally extending rods, such that the housing may be supported by said rods in either one of two orientations on external electrolytic circuit supports and either ends of the articles protruding from said housing is capable of being positioned downward to depend into an electrolytic treating bath.

4,312,717
PROCESS FOR PRODUCING 2-(2'-METHYL-1'-PROPENYL)-4-METHYLTETRAHYDROPYRAN

Gohu Suzukamo, Ibaraki; Tetsuo Takano, Takatsuki; Mitsuhisa Tamura, Ibaraki, and Kiyoshi Ikimi, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

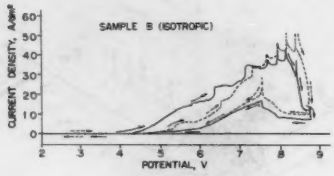
Filed Jun. 12, 1980, Ser. No. 158,810
Claims priority, application Japan, Jun. 19, 1979, 54-77919; Jun. 20, 1979, 54-78602
Int. Cl.³ C25B 3/02
U.S. Cl. 204—59 R 8 Claims

1. A process for producing 2,6-dimethyl-3-alkoxyoct-1-en-8-ol, which comprises anodic alkoxylation of citronellol in an alcohol in the presence of an alkali metal benzene or toluene sulfonate as a supporting electrolyte.

4,312,718
METHOD FOR PRODUCING FLUORINE

Nobuatsu Watanabe, 136, Uguisudai, Nagaokakyo-shi, Kyoto, Japan; Minoru Aramaki, and Yasushi Kita, both of Ube, Japan, assignors to Nobuatsu Watanabe, Kyoto; Central Glass Co., Ltd., Ube and Toyo Tanso Co., Ltd., Osaka, all of, Japan

Filed Jun. 20, 1980, Ser. No. 161,593
Claims priority, application Japan, Aug. 2, 1979, 54-98068
Int. Cl.³ C25B 1/24
U.S. Cl. 204—60 9 Claims



1. A method for producing fluorine comprising electrolyzing an electrolyte comprising a mixed molten salt system of potassium fluoride and hydrogen fluoride in an electrolytic cell having as an anode a carbon block, characterized in that the electrolysis of the electrolyte is conducted using as the anode a carbon block having an anisotropy of not more than 1.2 in terms of an anisotropoic ratio of specific resistance.

4,312,719
ELECTROCHEMICAL PROCESS FOR INCORPORATING COPPER IN NYLON

LeMoyne W. Plischke, and Joseph M. Kiefer, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

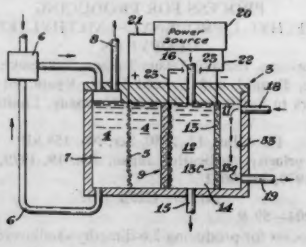
Filed Nov. 24, 1980, Ser. No. 209,622
Int. Cl.³C25B 3/12; C08J 3/02; C08L 77/00
U.S. Cl. 204—72 11 Claims

1. A process for dissolving a metal in an aqueous solution of polyamide-forming salt, comprising applying an electrical potential between an anode and a cathode which are spaced from one another and in contact with said solution, wherein the surface of the anode comprises said metal and wherein said potential is of sufficient magnitude to dissolve said metal.

4,312,720
ELECTROLYTIC CELL AND PROCESS FOR ELECTROLYTIC OXIDATION

Joseph D. Lefevre, Bay City, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 939,602, Sep. 5, 1978, Pat. No. 4,213,833. This application May 2, 1980, Ser. No. 145,904
The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.
Int. Cl.³ C25B 1/34, 9/04, 9/00
U.S. Cl. 204—78 16 Claims



9. In an improved electrolytic cell with an anode compartment adapted to contain an anolyte, an anode positioned in said anode compartment; a cathode compartment adapted to contain a catholyte; a cathode positioned in said cathode compartment; an ion exchange membrane or diaphragm spacing apart said anode and said cathode; means for providing electrical current to said anode and said cathode, the improvement comprising:

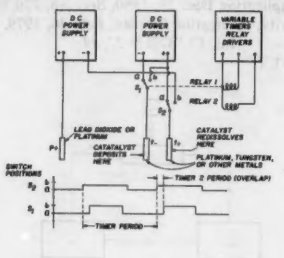
an electrically conductive foraminous support element for the diaphragm or ion exchange membrane and

means for controlling the support element at a voltage potential sufficient to minimize corrosion of the support element yet insufficient to cause the occurrence of substantial amounts of anodic and cathodic reactions at the support element.

4,312,721
ELECTROLYTIC OXIDATION PROCESS

Klaus H. Oehr, Surrey, Canada, assignor to B.C. Research Council, Vancouver, Canada

Filed May 15, 1980, Ser. No. 149,904
Int. Cl.³ C25B 3/02
U.S. Cl. 204—78 11 Claims

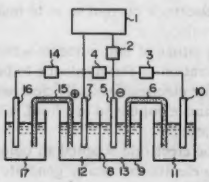


1. In an electrolytic process for converting cerous ion to ceric ion in an electrolytic cell including a cathode, an anode and an electrolyte the improvement that comprises incorporating cobalt into the electrolyte in addition to the cerous ion.

4,312,722
PROCESS FOR PREPARING NITRITES

Mitsuo Yoshida, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1979, Ser. No. 81,897
Claims priority, application Japan, Oct. 6, 1978, 53-122736; Oct. 6, 1978, 53-122737
Int. Cl.³ C25B 1/00, 11/04
U.S. Cl. 204—91 13 Claims



1. A process for the preparation of nitrites by electrolytic reduction, comprising supplying an aqueous solution containing a nitrate into a cathode chamber of an electrolytic cell including cathode and anode chambers separated by a cation exchange membrane, and applying an electric current to the electrolytic cell while maintaining the pH of the aqueous solution at a value of about 4 to about 10, said cation exchange membrane exerting the functions of separating the catholyte and anolyte by defining the cathode and anode chambers,

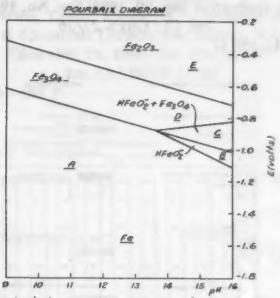
supplying protons to the cathode chamber while preventing re-oxidation in the anode chamber and separating gases generated in both of said chambers.

4,312,723

CORROSION RESISTANT ELECTROLYTIC CELL

John M. McIntyre, and Donald L. Caldwell, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 9, 1980, Ser. No. 157,621
Int. Cl.³ C25B *1/34*; C23F *13/00*
U.S. Cl. 204—98 **10 Claims**



Potential-pH equilibrium diagram for the system iron-water, at 25°C (considering as solid substances only Fe, Fe_3O_4 and Fe_2O_3)

5. A method of operating an electrolytic cell which has an anode in an anode chamber; a low overvoltage cathode in a cathode chamber; iron-containing materials exposed to the cathode chamber and coated with a protective coating at a level sufficient to minimize the ionization of iron wherein the iron-containing materials are electrically connected with the cathode; and means for impressing a voltage on the anode and on the cathode said method comprising:

feeding an aqueous electrolyte solution to the anode chamber;

impressing a sufficient voltage to the anode and the cathode to cause electrolytic reactions to occur; wherein said voltage maintains the iron containing materials at a voltage level about the same as the voltage of the cathode; and

removing the products of electrolysis.

4,312,724

METHOD FOR THE RECOVERY OF LEAD FROM MATERIALS CONTAINING LEAD SULFIDE

Roland Kammel, Mommsenstrasse 24, D-1000 Berlin 12, and Hans-Wilhelm Lieber, Ilsensteinweg 3g, D-1000 Berlin 38, both of Fed. Rep. of Germany

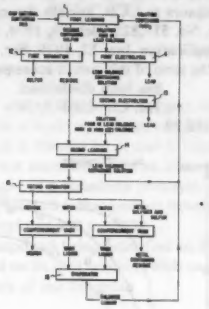
Continuation of Ser. No. 44,264, May 31, 1979, abandoned. This application Jun. 5, 1979, Ser. No. 45,731
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823714
Int. Cl.³ C25C *1/18*
U.S. Cl. 204—117 **14 Claims**

1. Method for recovery of lead from a lead sulfide containing material comprising:

(a) leaching said material in a leaching vessel containing a chloride solution to which iron (III) chloride is added as an oxidation agent, to produce an iron (II) chloride solution rich in lead chloride;

(b) conducting said iron (II) chloride solution rich in lead chloride to an electrolytic cell not containing a permselective membrane or a diaphragm; said electrolytic cell comprising at least one insoluble anode; at least one cathode for the cathodic deposition of lead; and an electrolyte;

(c) subjecting said iron (II) chloride solution rich in lead chloride to electrolysis in said electrolytic cell to deposit metallic lead cathodically and to obtain an electrolyte comprising iron (III) ions formed by the reoxidation of iron (II) chloride at the anode, while causing said iron (II) chloride solution to move from the cathode to the anode



of said cell by sucking off said electrolyte containing iron (III) ions at/or behind said anode; and

(d) returning said electrolyte containing said iron (III) ions to said leaching vessel.

4,312,725

CONTACT LENSES OF HIGH GAS PERMEABILITY AND METHOD

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 913,569, Jun. 8, 1978, Pat. No. 4,228,269. This application Jan. 31, 1980, Ser. No. 117,109
Claims priority, application European Pat. Off., Jun. 6, 1979, 79301057
Int. Cl.³ C08F *6/00, 8/00*; G02C *7/04*
U.S. Cl. 204—159.22 **17 Claims**

1. A contact lens having an oxygen gas permeability constant of at least

$$1.5 \times 10^{-11} \frac{\text{ml } (O_2)\ \text{cm}^2}{\text{sec ml mm Hg}}$$

comprising homopolymers and interpolymers formed by the polymerization of monomers comprising at least one alkyl styrene monomer having at least one C_1 or higher alkyl group on the aromatic ring and having its surface modified by chemical treatment or ultraviolet light to lower the contact wetting angle thereof.

13. The method of lowering the contact wetting angle of a contact lens having an oxygen gas permeability constant of at least

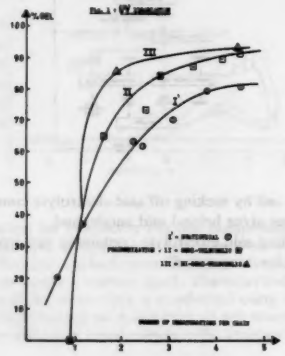
$$1.5 \times 10^{-11} \frac{\text{ml } (O_2)\ \text{cm}^2}{\text{sec ml mm Hg}}$$

comprising a homopolymer or interpolymer formed by the polymerization of monomers comprising at least one alkyl styrene monomer having at least one C_1 or higher alkyl group on the aromatic ring, comprising exposing the surfaces of said lens to an oxidizing solution at a temperature and for a time sufficient or an ultraviolet light at a wattage and wavelength sufficient to lower the contact wetting angle thereof below that of untreated lenses of identical composition.

4,312,726
SEMI-TELECHELIC OLEFINICALLY-UNSATURATED ORGANIC POLYMERS

August Vrancken, Dworp, and Paul Dufour, Ruisbroek, both of Belgium, assignors to UCB, Societe Anonyme, Belgium

Division of Ser. No. 517,822, Oct. 24, 1974, Pat. No. 4,177,338.
This application Jan. 12, 1979, Ser. No. 3,479
The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.
Int. Cl.[3] C08F 8/14
U.S. Cl. 204—159.23 16 Claims



1. An organic polymer compound having semitelechelic olefinic unsaturation, of the formula:

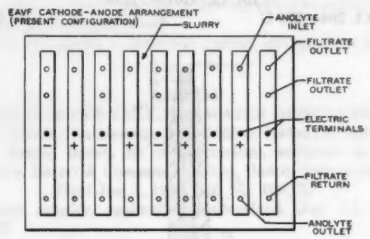
$$V-W-(X)_x-(Y)_y-H \quad (I)$$
$$\quad\quad\quad

are normal boundary points, a standard position computing step for determining standard positions through statistical processing of the data having been judged as normal by said normal fraction judging step in combination with numerous data having normal fractions previously obtained, said method being so adapted as to determine boundary points on densitograms of unknown samples using said standard positions as reference.

4,312,729
DEWATERING WITH ELECTRICALLY AUGMENTED VACUUM FILTER

Walter R. Wills, Cedar Knolls, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Oct. 31, 1980, Ser. No. 202,407
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—180 P **11 Claims**



1. In a system for dewatering a suspension of particulate solids such as hydrous kaolin clay using a known electrically augmented vacuum filter apparatus comprising a tank adapted to receive and discharge suspension to be filtered, and anodic and cathodic electrode structures adapted to be positioned in said tank in a manner such as to be submerged in suspension in said tank, said anodic electrode structure being adapted for deposition thereon of filter cake and including an anodic element, electrically nonconductive housing surrounded by a filter medium for said anodic element and means for supplying anolyte into and out of said housing, said cathodic electrode structure including a cathodic element and being surrounded by a filter medium adapted for the passage therethrough of filtrate,

the improvement which comprises a perm-selective membrane associated with said anodic structure in a manner such as to permit passage of cations from said anolyte therethrough and into and through said filter cake and suspension to be filtered while substantially preventing passage of anions and gaseous electrochemical reaction products from said anolyte therethrough and into filter cake deposited on said anodic structure.

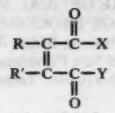
4,312,730
HEAT-CURABLE AQUEOUS COATING COMPOSITIONS FOR ANODIC DIP-ELECTROCOATING

Wilfried Bartz, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,130
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945569
Int. Cl.³ C25D *13/00*
U.S. Cl. 204—181 R **8 Claims**

1. A heat curable aqueous anodic electrocoating composition comprising (a) a water-soluble and/or water-dispersible addition compound at least partially neutralized with a basic compound and esterified, the addition compound comprising

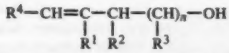
10–35% by weight of one or more α,β-unsaturated dicarboxylic acids up to 8 carbon atoms and of the formula



wherein R and R′ are an H atom, a halogen atom or an alkyl group; X and Y are a hydroxy group, an alkoxy group or an oxygen bond which is formed by X and Y together, assuming that X and Y are not simultaneously an alkoxy group; and

65–90% by weight of a butadiene polymer, liquid at 20° C. and having at least 50 molar percent butadiene units and a molecular weight of 400 to 6,000,

the addition compound being esterified to 20–70 equivalent percent, based on its acid number, with one or more unsaturated alcohols of the formula



wherein

R^1, R^2, and R^3 are identical or different and each independently is hydrogen or methyl,

R^4 is hydrogen or C_{1-5}-alkyl, and

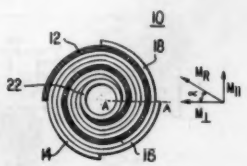
n is 0 or 1, and

(b) water.

4,312,731
MAGNETICALLY ENHANCED SPUTTERING DEVICE AND METHOD

Charles F. Morrison, Jr., Boulder, Colo., assignor to VAC-TEC Systems, Inc., Boulder, Colo.

Filed Apr. 24, 1979, Ser. No. 32,768
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **74 Claims**

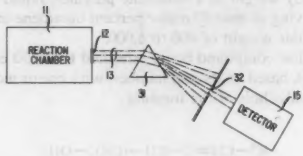


1. A magnetically enhanced sputter apparatus wherein at least a closed loop portion of a plasma path is formed adjacent a layer of target material having a sputtering surface, said apparatus comprising a substantially circular magnetic field source for establishing said magnetic field (a) substantially parallel to at least a portion of said sputtering surface and (b) at an acute angle α of at least ±3° with respect to a radial extending from the center of the circular magnetic field source so that said angle is in a plane which is substantially parallel to said portion of the sputtering surface.

4,312,732
METHOD FOR THE OPTICAL MONITORING OF PLASMA DISCHARGE PROCESSING OPERATIONS

Eugene O. Degenkolb, Basking Ridge; James E. Griffiths, and Cyril J. Mogab, both of New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 719,259, Aug. 31, 1976, abandoned. This application Mar. 10, 1980, Ser. No. 128,837
Int. Cl.³ C23C *15/00*; C23F *1/00*
U.S. Cl. 204—192 E **5 Claims**

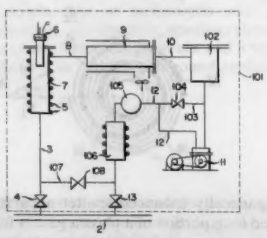


1. A method for fabricating a device comprising the steps of
(a) subjecting a body to a plasma discharge wherein said body comprises a resist material in intimate contact with an underlying material in a substrate body;
(b) passing a portion of the electromagnetic radiation produced by said plasma discharge into a radiation detector which produces an output signal dependent upon the intensity of said portion of radiation; and
(c) removing said body from contact with the plasma discharge after said output signal passes a predetermined threshold value characterized in that the portion of electromagnetic radiation is a frequency limited portion of half width no greater than 150 Angstroms including radiation of a frequency corresponding to radiation from a preselected excited species including particles resulting from chemical combination of entities from said body with entities from said plasma discharge.

4,312,733
UNIT FOR MEASURING ALKALI METAL VAPOR CONCENTRATION

Susumu Ninomiya; Fumio Ohtsuka; Hiromichi Nei, all of Yokohama; Mituo Harata, Kawasaki; Osamu Takikawa, Chigasaki, and Atsuo Imai, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 6, 1979, Ser. No. 73,134
Claims priority, application Japan, Sep. 25, 1978, 53-116687
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—195 S **7 Claims**

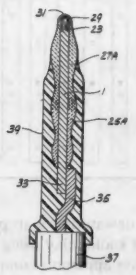


1. A unit for measuring the alkali metal vapor concentration of a gaseous phase, serially comprising in the gas flow direction;
a gas inlet pipe connected to a source of alkali metal vapor containing gas,
a container provided with a heating means for vaporizing the alkali metal mist contained in the gas, and a sensor utilizing a β-alumina porcelain as electrolyte and serving to measure the alkali metal vapor concentration,
a vapor trap connected to the container via a gas conduit and serving to condense and remove the alkali metal vapor contained in the gas,
a gas pump having the suction port connected to the vapor trap via a gas conduit,
a gas discharge pipe connected to the discharge port of the gas pump; and
a bypass pipe provided with a valve and connected between the gas inlet pipe and gas discharge pipe.

4,312,734
ION-SELECTIVE ELECTRODE

Michael F. Nichols, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Feb. 19, 1980, Ser. No. 122,370
Int. Cl.³ G01N *27/36*
U.S. Cl. 204—195 G **10 Claims**



1. A dry glass electrode for use in potentiometric analysis of aqueous media comprising a metal conductor constituted of a metal selected from the group consisting of platinum, gold, and tantalum, a layer comprising an oxide of said metal having a thickness of between about 50 Angstrom units and about 2 microns on an outer surface of said metal conductor, and an ion-selective glass membrane over and in electrical contact with said oxide layer, said ion-selective glass having a coefficient of thermal expansion differing by less than about 25% from the coefficient of thermal expansion of said metal.

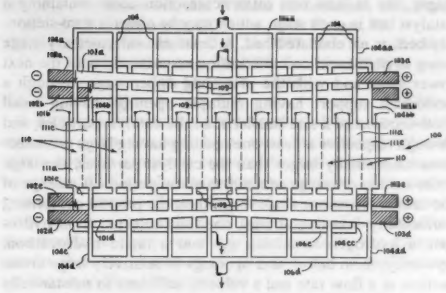
4,312,735
SHUNT CURRENT ELIMINATION

Patrick G. Grimes, Westfield, N.J.; Markus Zahn, Gainesville, Fla., and Richard J. Bellows, Westfield, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 97,194, Nov. 26, 1979. This application Jun. 16, 1980, Ser. No. 160,143
Int. Cl.³ C25B *15/08, 9/04*; C25C *7/00*; H01M *8/24*
U.S. Cl. 204—228 **33 Claims**

1. An electrochemical device, comprising:
at least one common manifold;
a plurality of cells fluidically communicating through corresponding channels with said one common manifold, said manifold and channels adapted to contain a common electrolyte for said cells, said electrolyte providing an electrical electrolytic conductive bypass path around said cells which is capable of resulting in undesirable shunt currents;
at least one tunnel intersecting and connecting with each of said corresponding channels, said tunnel having a given electrical resistance as between said corresponding channels which increases towards a mid-portion of said tunnel, for substantially eliminating any voltage difference be-

tween each of said cells and their corresponding tunnel and channel intersections when a protective current is



passed into said tunnel for providing effective reduction of said shunt currents; and

means for passing a protective current into said one tunnel.

4,312,736

ELECTROLYSIS CELL FOR WATER DISSOLUTION

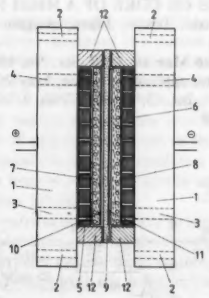
Anton Menth, Nussbaumen; Rene Müller, Fislisbach, and Samuel Stucki, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 2, 1980, Ser. No. 109,131

Claims priority, application Switzerland, Jan. 17, 1979, 436/79

Int. Cl.³ C25B *9/00, 11/06, 11/12*

U.S. Cl. 204—255 **10 Claims**



1. An electrolysis cell with a solid substance electrolyte made of synthetic polymer for water dissolution, wherein, for the supply of electricity and water, on each side of the solid electrolyte there is a bipolar plate functioning alternately as an anode and as a cathode, with layers of coarse porous material and fine porous material attached to each said bipolar plate, and the solid substance electrolyte between the finely porous substances, with catalysts on both sides of the electrolyte.

4,312,737

ELECTRODE FOR MONOPOLAR FILTER PRESS CELLS

Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 25, 1980, Ser. No. 143,969

Int. Cl.³ C25B *9/00, 11/03*

U.S. Cl. 204—257 **14 Claims**

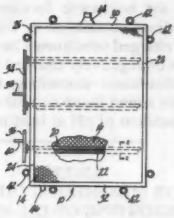
1. An electrode for a monopolar filter press cell which comprises:

(a) two vertical foraminous surfaces positioned in parallel and spaced apart,

(b) a frame having two side members, a top member, and a bottom member attached to said foraminous surfaces,

(c) a chamber formed between said foraminous surfaces and bounded by said frame,

(d) conductor rods passing through one of said side members of said frame into said chamber, said conductor rods being spaced apart from said foraminous surfaces,



(e) foraminous conductive connectors positioned in said chamber and attached to said conductor rods and to said foraminous surfaces, said foraminous conductive connectors being selected from the group consisting of "U", "V", semicircular, parabolic, elliptical, semioctagonal, or semirectangular, and

(f) inlets and outlets in said frame for introducing fluids into and removing electrolysis products from said chamber.

4,312,738

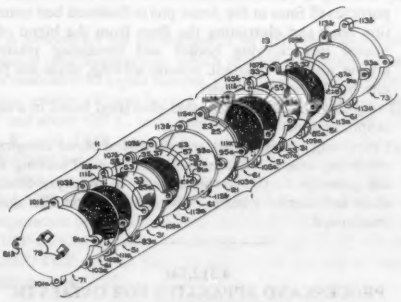
CATHODE ELECTROCATALYSTS FOR SOLID POLYMER ELECTROLYTE CHLOR-ALKALI CELLS

Cletus N. Welch, Clinton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 15,527, Feb. 23, 1979. This application Sep. 10, 1980, Ser. No. 185,819

Int. Cl.³ C25P *13/02*

U.S. Cl. 204—282 **6 Claims**



1. A method of preparing a solid polymer electrolyte having porous catalyst particles deposited on a surface of a permionic membrane, comprising:

(a) flame spraying an alloy of a transition metal and leachable metal onto a surface, forming particles thereof;

(b) leaching the sprayed particles to form porous particles;

(c) depositing the sprayed, leached particles on the permionic membrane.

4,312,739

MEDIUM FOR ISOELECTRIC FOCUSING

Hasse A. Hansson, and Sven L. Kådgedal, both of Uppsala, Sweden, assignors to Pharmacia Fine Chemicals, AB, Upsala, Sweden

Filed Sep. 30, 1980, Ser. No. 192,295
Claims priority, application Sweden, Oct. 11, 1979, 7908454
Int. Cl.³ G01N 26/26
U.S. Cl. 204—299 R 4 Claims

1. A medium for isoelectric focusing based on agarose, wherein said medium consists of or comprises agarose into which positively charged substituents have been introduced to the neutralisation of negatively charged groups present in the medium, said substituents containing as the only charged group a quaternary amino group and the charge of said substituents being independent of pH at least in the range 2–12.

4,312,740

PROCESS FOR MAXIMIZING OIL YIELD IN THE RETORTING OF OIL SHALE

Gerald R. Chiaramonte, Arvada, Colo., assignor to Tosco Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 884,492, Apr. 8, 1978, abandoned. This application Nov. 27, 1979, Ser. No. 97,718
Int. Cl.³ C10G 1/00, 9/28; C10B 47/00, 21/20
U.S. Cl. 208—11 R 21 Claims

1. A process for the recovery of shale oil from oil-bearing shale comprising the steps of:

(a) pyrolyzing oil shale by heating the oil shale with heat-carrying bodies comprising relatively coarse attrition resistant, non-oil sorbing shale ash solids in a pyrolysis zone to form shale oil vapors and a solids blend of cooled heat-carrying bodies and spent shale particles containing fixed carbon, said solids blend further containing sorbed oils and vapors trapped in interstices thereof;

(b) separating the shale oil vapors from said solids blend in a separation zone and passing the separated shale oil vapors to a recovery zone;

(c) stripping and vaporizing the sorbed and trapped oils and vapors from said solids blend in a steam stripping zone and passing the stripped oils and vapors to said separation zone;

(d) reheating the cooled heat-carrying bodies in a dense phase fluidized bed combustion zone by combusting therein the fixed carbon contained in the stripped spent shale particles to form hot flue gases and shale ash comprising friable, oil sorbing particles and relatively coarse, attrition resistant, non-oil sorbing particles;

(e) attriting a substantial portion of the friable shale ash particles to fines in the dense phase fluidized bed combustion zone and elutriating the fines from the blend of reheated heat-carrying bodies and remaining relatively coarse, attrition resistant, non-oil sorbing, shale ash particles by the hot flue gases;

(f) stripping flue gases from said elutriated blend in a steam stripping zone; and,

(g) recycling said stripped and elutriated blend comprising relativley coarse, attrition resistant, non-oil sorbing shale ash particles to the pyrolysis zone to pyrolyze fresh oil shale fed therein whereby oil recovery from the shale is maximized.

4,312,741

PROCESS AND APPARATUS FOR CATALYTIC HYDROCARBON CONVERSION

Yves Jacquin, Sevres, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 9, 1980, Ser. No. 167,281
Claims priority, application France, Jul. 9, 1979, 79 17947
Int. Cl.³ C10G 1/00, 1/06, 45/00, 35/00
U.S. Cl. 208—11 LE 10 Claims

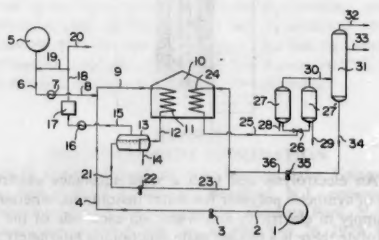
1. A liquid phase process for the catalytic conversion of hydrocarbons or carbon monoxide in the presence of hydrogen, consisting essentially of passing a liquid phase and a hydrogen-containing main gas stream upwardly through at least one catalytic reaction zone comprising several superposed stages, the at least one catalytic reaction zone containing a catalyst bed in each stage which may be either a semi-stationary bed or an ebullated bed, at least one intermediary stage being in permanent communication respectively with the next lower stage and with the preceding upper stage, through a perforated support having multiple openings having small cross-sections of a size smaller than the catalyst particles, and through respective at least one opening having large cross-sections substantially larger than the catalyst particles, the large cross-section openings adapted to allow periodical passage of the catalyst from one stage to another, the process comprising periodically injecting at least one fluid selected from hydrogen, a hydrogen-containing gas and a liquid hydrocarbon, upwardly, from below said openings of relatively large cross-section, at a flow rate and a velocity sufficient to substantially slow down or impede the passage of the catalyst from one stage to the next lower stage through said openings of relatively large cross-section, and periodically discontinuing the injection, or periodically reducing the injection flow rate from below at least one of said openings of relatively large cross-section, to allow passage of the catalyst, downwardly through said at least one of said openings of relatively large cross-section from one stage to the next lower stage.

4,312,742

PROCESS FOR THE PRODUCTION OF A PETROLEUM PITCH OR COKE OF A HIGH PURITY

Kiyoshige Hayashi, Tokyo, Japan, assignor to Hi-Max Ltd., Tokyo, Japan

Filed May 16, 1980, Ser. No. 150,431
Claims priority, application Japan, May 29, 1979, 54-65558
Int. Cl.³ C10G 57/00, 9/14
U.S. Cl. 208—50 8 Claims



1. A process for the production of a petroleum coke or pitch of a high purity from a petroleum heavy residue which comprises pretreating the residue with hydrogen gas in the absence of a catalyst under a hydrogen pressure of about 20–200 kg/cm² and under a gradual heating up to a final temperature of about 350°–400° C. so as to heat the residue from about 150° C. to about 300° C. over 30 to 120 minutes with prevalent occurrence of hydrogenation reaction and then from about 300° C. to the final temperature over 10 to 60 minutes with prevalent occurrence of dehydrogenation and polycondensation reactions; transferring the residue thus treated into a settler to liberate the hydrogen gas remained and to remove a precipitated mass containing impurities from the residual oil; and heat-soaking the residual oil thus separated until a desired amount of a petroleum coke or pitch of a high purity is formed.

4,312,743

FCC PROCESS USING CATALYST PRODUCED FROM USED FCC CATALYST

Hosheng Tu, Shorewood, and William D. Schlueter, Oak Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 59,938, Jul. 23, 1979, Pat. No. 4,261,861.
This application Aug. 20, 1980, Ser. No. 179,908
Int. Cl.³ C10G 11/05
U.S. Cl. 208—120 11 Claims

1. A process for cracking a hydrocarbon charge stock which comprises contacting said charge stock at cracking conditions with a catalytic composite prepared by impregnating a regenerated used FCC catalytic composite comprising a first zeolitic crystalline aluminosilicate dispersed in a porous inorganic oxide matrix with particles of a second zeolitic crystalline aluminosilicate, the pores of said compoiste having diameter greater than the diameters of said particles of said second zeolitic crystalline aluminosilicate.

4,312,744

FCC PROCESS USING LOW COKE-MAKE FCC CATALYST

Hosheng Tu, Shorewood, and David C. DeCoster, Countryside, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 70,935, Aug. 29, 1979, Pat. No. 4,263,174.
This application Feb. 9, 1981, Ser. No. 232,497
Int. Cl.³ C10G 11/05
U.S. Cl. 208—120 6 Claims

1. A process for cracking a hydrocarbon charge stock which comprises contacting said charge stock at cracking conditions with a catalytic composite prepared by the method which comprises:

(a) preparing a catalyst powder comprising a zeolite crystalline aluminosilicate dispersed in a porous carrier material consisting essentially of silica, zirconia and alumina;

(b) mixing said powder with a sufficient amount of an aqueous solution of a water soluble rare earth salt to form a slurry of said catalyst powder, the stoichiometric excess concentration of said rare earth salt in the solution being sufficient to impart to the final catalyst a weight ratio on a volatile free basis of rare earth ions to said carrier material greater than 1.0:100.0;

(c) filtering or centrifuging said slurry to separate therefrom a filter cake containing said catalyst powder; and

(d) calcining said filter cake without washing or drying said filter cake and recovering the resultant catalytic composite.

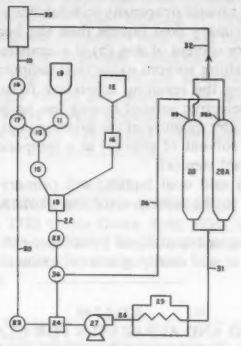
4,312,745

NON-PUFFING PETROLEUM COKE

Harry L. Hsu, Johnson City; Lloyd I. Grindstaff, Elizabethton, both of Tenn., and Mack P. Whittaker, Stamford, Conn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 8,839, Feb. 2, 1979, abandoned.
This application Mar. 31, 1980, Ser. No. 135,716
Int. Cl.³ C10G 9/14
U.S. Cl. 208—125 10 Claims

1. In a process for the manufacture of non-puffing needle coke suitable for graphitization by delayed coking of petroleum feedstocks having a level of sulfur content combined molecularly in components of said feedstock sufficiently high enough to contribute to an irreversible volumetric expansion of the coke on heating to a temperature of 1400° C. or higher, the improvement comprising the addition and dispersion of a chromium compound into the feedstock prior to or during coking of the feedstock in a delayed coker, said chromium



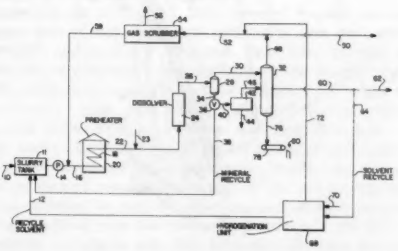
compound being added in an amount effective to render the coke non-puffing.

4,312,746

CATALYTIC PRODUCTION OF OCTAHYDROPHENANTHRENE-ENRICHED SOLVENT

Shirley C. Tsai, and Howard G. McIlvried, III, both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 5, 1980, Ser. No. 118,762
Int. Cl.³ C10G 45/00; C07C 5/10
U.S. Cl. 208—143 19 Claims



1. A process for the production of an OHP-enriched solvent for use in coal liquefaction, which process comprises contacting a coal-derived liquid solvent, said solvent being coal liquefaction reactor effluent having a boiling range between about 200° and about 500° C. and consisting essentially of OHP, THP and P, said OHP and THP being present in a ratio of OHP/THP below 0.4, with hydrogen in the presence of a supported catalyst consisting essentially of Group VIB and Group VIII metals under hydrogenation conditions including a temperature between about 260° and about 427° C. to provide an OHP-enriched solvent containing OHP and THP in a ratio of OHP/THP greater than 0.4 and below 15, and at least 1 weight percent THP.

4,312,747

PROCESS FOR DEASHING PRIMARY COAL LIQUIDS

John G. Gatsis, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 19, 1980, Ser. No. 122,163
Int. Cl.³ C10G 1/00
U.S. Cl. 208—177 6 Claims

1. In a process for deashing coal liquid by primary and

secondary solvent extraction at a deashing solvent extraction temperature, the method which comprises:

(a) admixing said coal liquid and a first selective solvent having a greater propensity to solubilize a greater quantity of the primary coal liquids than the hereinafter defined secondary solvent of step (b) at a temperature higher than said deashing solvent extraction temperature;

(b) admixing the resulting admixture from step (a) with a second selective solvent having less propensity to solubilize a greater quantity of the primary coal liquids than said primary solvent of step (a) at a temperature lower than that of said step (a);

(c) cooling said coal liquids, and primary and secondary solvents to the selective solvent extraction temperature; and

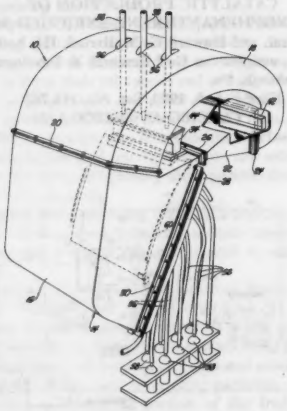
(d) deashing said coal liquid by solvent extraction with said solvents at said deashing solvent extraction temperature.

4,312,748

METHOD AND APPARATUS FOR CLASSIFYING PARTICLES OF POWDER METAL

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 15, 1980, Ser. No. 149,919
Int. Cl.³ B07B *4/02*
U.S. Cl. 209—5 **25 Claims**



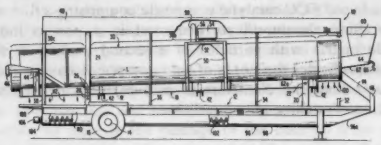
1. An apparatus (10) for classifying desirable particles of powder material by size and removing particles of undesirable material of a differnt density than the desirable particles, said apparatus (10) comprising; a housing (14) defining a closed flow path for a recirculated stream of gas, particle supply means (34) for introducing particles into the housing at a controlled rate in an initially downwardly falling stream of particles of desirable material and undesirable material, a series of particle-receiving receptacles (40) located below and downstream of said particle supply means and serially arranged along the direction of flow of the stream of gas in a direction away from said particle supply means (34) for collecting desirable particles of a different predetermined size range for each receptacle (40) and particles of undesirable material of a different size than said predetermined size range for each respective receptacle (40), an electrostatic gas ionizer (42) disposed upstream of said particle supply means (34) for ionizing the gas and a screen (44) in the stream of gas between said ionizer (42) and said particle supply means (34) for attracting the ionized gas from said ionizer (42) while allowing the passage of gas therethrough for establishing the recirculated stream of gas to impinge the stream of falling particles to charge the particles and impart to each particle a horizontal component of velocity so that the particles repel one another and the trajectories of the particles will vary depending upon the size and density thereof.

4,312,749

TRAILER MOUNTED, PORTABLE COAL WASHING AND SEPARATING APPARATUS

Harold L. Bingham, Rte. 3, Richmond, Ky. 40475

Filed Apr. 27, 1981, Ser. No. 258,165
Int. Cl.³ B03B *5/56*
U.S. Cl. 209—44 **7 Claims**



1. An improved vehicle trailer mounted apparatus for separating coal from material of higher specific gravity, said apparatus comprising:

an open ended, elongated cylindrical drum,

means for mounting said drum for rotation about its axis and inclined slightly from the horizontal with its rear end lower than its front end,

helical strips mounted to the inner wall of said drum and extending radially upwardly therefrom,

an inclined coal delivery chute opening into the upper end of said drum for supplying unwashed coal to said drum,

means for flushing said chute with water for driving unwashed coal on said chute into said drum,

means for maintaining a layer of water within the bottom of said drum such that the lighter specific gravity coal material floats with the water towards the lower, rear end of said drum, and

means for rotating said drum about its axis to agitate the materials within the accumulated water and to drive the higher specific gravity material captured by said helical strips towards the upper, open end of said drum,

the improvement comprising:

screened openings within said drum adjacent to its lower end and separated by a plurality of longitudinally spaced annular baffle walls bearing central openings and forming longitudinally adjacent compartments and,

angled diverter strips carried by said drum along the inner wall thereof overlying the screened openings and extending within compartments defined by said longitudinally spaced annular baffle walls and acting to lift coal over the longitudinally spaced baffle walls and through the baffle wall central openings to permit axial drum discharge of the washed and separated coal while permittng water and waste fines to fall by gravity through the screened openings at the lower end of said drum.

4,312,750

GRAIN CLEANING APPARATUS

Keith A. Braun, Northwood, and John F. Johannsen, Rockford, both of Iowa, assignors to David Manufacturing Co., Mason City, Iowa

Filed Aug. 11, 1980, Ser. No. 177,071
Int. Cl.³ B07B *1/24*
U.S. Cl. 209—291 **11 Claims**

1. An apparatus for cleaning dirty grain comprising:

a frame;

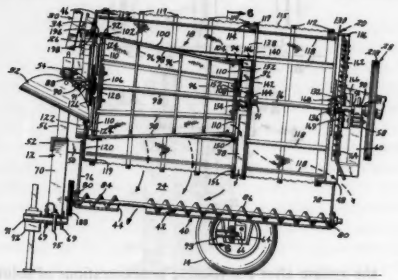
first screen means, attached rotatably to said frame, for receiving said dirty grain and separating coarse foreign materials from said grain, said first screen means having input and output ends;

second screen means, encircled about said first screen means and attached rotatably to said frame, for receiving said

grain from said first screen means and separating fine foreign materials from said grain, said second screen means having input and output ends and an internal periphery therebetween;

means for rotating said first and second screen means simultaneously in opposite directions;

means for advancing said grain in a longitudinal direction from the input end of said first screen means to the output end of said second screen means; and



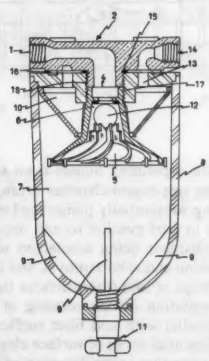
means for removing the coarse foreign materials from said apparatus within the longitudinal distance between the input end of said first screen means and the output end of said second screen means, said removing means being attached to said internal periphery of second screen means adjacent said output end of said first screen means; whereby said dirty grain at the input end of said first screen means is cleaned of coarse and fine foreign materials as it advances to the output end of said second screen means.

4,312,751

CENTRIFUGAL WATER SEPARATOR

Jordi Casamitjana, 3a. Cda. de Camino de Minas 139, Mexico 18, D. F., Mexico

Filed Oct. 19, 1979, Ser. No. 86,381
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—94 **8 Claims**



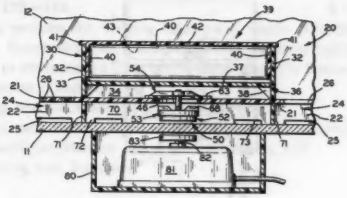
1. A device for separating contaminants from a liquid with which such contaminants are not miscible and which is less dense than said contaminants, comprising an inlet and outlet portion formed with an inlet opening for allowing liquid to enter the device and an outlet opening for allowing liquid to leave the device, and a separator portion, said separator portion being releasably secured to said inlet and outlet portion and including a generally cylindrical receptable which, in use, is disposed with its central axis substantially vertical and with the inlet and outlet portion of the device at its upper end, and an impeller element at the upper end of the cylindrical receptacle and disposed to receive liquid entering the device by way of said inlet opening and to conduct such liquid into the receptacle while imparting a rotational component of movement thereto, whereby said contaminants are separated from the liquid by centrifugal effects and settle to the bottom of the receptacle while liquid having contaminants separated therefrom leaves the device by way of said outlet opening.

4,312,752

AQUARIUM FILTER APPARATUS

Richard J. Malik, 2721 Morin Grove, Erie, Mich. 48133

Filed Mar. 19, 1980, Ser. No. 131,658
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **9 Claims**



1. In an aquarium tank having a bottom and side walls for retaining a body of liquid, a fluid filter apparatus comprising:

means for supporting gravel in the tank including a horizontal perforated plate extending between the side walls of the tank and spaced above the bottom thereof defining a fluid dispersion chamber;

a receptacle for containing filter material located on an upper side of said horizontal perforated plate and constructed and arranged to permit fluid flow through a plurality of apertures in said perforated plate spaced from side walls of said receptacle, said receptacle including a perforated cover plate and a perforated bottom plate spaced between said side walls of said receptacle; and

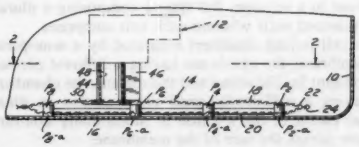
pump means including impeller means and magnetic means rotatably supported in said dispersion chamber and motor means located beneath the bottom of the tank for operatively rotating by magnetic coupling said impeller means whereby fluid from the tank is drawn through said filter material receptacle into said dispersion chamber and is discharged back into the tank through said plurality of apertures in said horizontal perforated plate spaced from said side walls of said receptacle.

4,312,753

INTANK FUEL FILTER

Steven L. Bell, 11127 Beaconsfield, Detroit, Mich. 48224

Continuation-in-part of Ser. No. 112,918, Jan. 17, 1980, abandoned. This application Feb. 9, 1981, Ser. No. 232,391
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—250 **17 Claims**



1. An intank fuel filter comprising, in combination:

opposed flexible fabric filter walls sealed together at their marginal edges;

a rib structure molded in situ to one of said walls and projecting therefrom (a) toward the opposite wall to space the walls apart, preventing collapse, and (b) toward the tank wall to space the filter fabric from such wall; and

means for connecting the interior space between the walls with a fuel intake for withdrawing fuel therefrom.

4,312,754

PORTABLE WATER PURIFIER ESPECIALLY FOR DOMESTIC USE

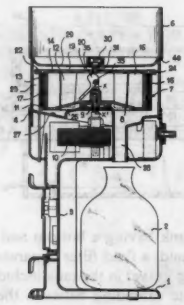
Pierre LaFontaine, Tarbes, France, assignor to SEB S.A., Selongey, France

Filed Jul. 15, 1980, Ser. No. 169,207

Claims priority, application France, Jul. 26, 1979, 79 19308

Int. Cl.³ B01D *25/06, 33/16*

U.S. Cl. 210—267 **9 Claims**



1. A portable water purifier, especially for domestic purposes, comprising a housing enclosing at its upper part a rotary filtering vessel having a central inlet opening and a perforated lateral wall bearing filtering layers, an open container for the water to be purified on the top of the housing and having a water outflow orifice in line with the central inlet opening of the filtering vessel, said filtering vessel having a closed bottom fastened to an output shaft on a rotary drive member at the lower part of the housing and an annular compartment surrounding the filtering vessel and bounded by the lateral wall of the housing to collect the water filtered through the filtering layers of said vessel, said annular compartment having a discharge outlet opening for discharging the purified water, said filtering layers comprising at least one layer whose porosity is selected to retain the bacteria contained in the water to be purified, said flow orifice of said container including a valve, and means to open the valve when the vessel is rotated.

4,312,755

REVERSE OSMOSIS SYSTEM

Sun-Tak Hwang, Iowa City, Iowa, assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 29, 1979, Ser. No. 53,587

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.1 **11 Claims**

1. A system for altering the relative concentration of solute to solvent in a solution, the system comprising a plurality of interconnected units wherein each unit comprises

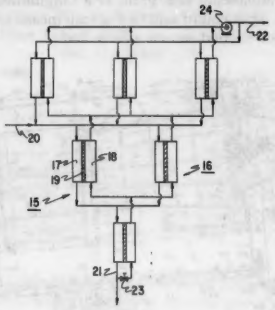
(a) a cell having chambers separated by a semi-permeable membrane, the membrane having a different permeability constant for the solute and the solvent, the chambers each having a sufficiently small cross section to direct the movement of the solution in substantially non-turbulent flow across the face of the membrane;

(b) means for conducting the solution which has passed through one chamber into the other chamber and for directing the solution so that it moves in opposite directions on either side of the membrane;

(c) means for creating a pressure differential across the membrane;

(d) at least one inlet means for feeding the solution into the system;

(e) at least one outlet means for recovering the solution from



the system after the relative concentrations of solute and solvent have been altered;

characterized in that the units are interconnected to form a configuration which is tapered in such a way that the linear velocity of the solvent is substantially constant throughout the system.

4,312,756

APPARATUS FOR THE SEPARATION OF LIQUIDS FROM SUSPENSIONS

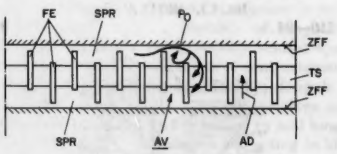
Franz O. Hug, c/o OFAG Zurich, Dufourstr. 90, 8008 Zurich, Switzerland

Filed Aug. 16, 1979, Ser. No. 67,045

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836866

Int. Cl.³ B01D *33/22*

U.S. Cl. 210—330 **13 Claims**



1. Apparatus for separating liquids from suspensions, comprising at least one suspension chamber arranged between two filter layers having substantially planar feed side filter surfaces arranged at least in part parallel to and opposite each other, said suspension chamber being connected with a suspension feed and a suspension and solid removal, and in said suspension chamber in the range of said filter surfaces there being at least one suspension agitating device rotating in a plane at least approximately parallel with said filter surfaces and having at least one circumferential series of surface elements arranged in circumferential succession in the direction of movement of the agitating device, said surface elements being arranged at an angle to the filter surfaces with axial passages between said surface elements for causing an oscillating suspension flow movement component between said opposite filter surfaces from one side filter surface to the opposite side filter surface, said surface elements, of the agitating device being arranged at angles at least in part different from each other in relation to the filter surfaces and/or with the distances from said filter surfaces at least in part different from each other.

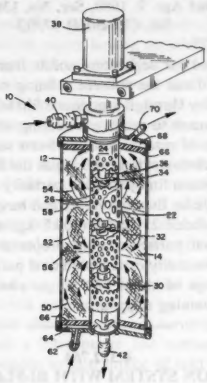
4,312,757
METHODS AND MEANS FOR CIRCULATING A DIALYSATE

Robert C. Brumfield, P.O. Dr. CC, 42 Lakeshore Ter., Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 28,239, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 935,928, Aug. 23, 1978, abandoned. This application Nov. 5, 1980, Ser. No. 204,152

Int. Cl.³ B01D *13/00*; C02F *1/44*

U.S. Cl. 210—646 **11 Claims**



1. The method of exposing generally longitudinally extending blood-carrying semi-permeable fibers, in a generally cylindrical blood dialysis cartridge having a coaxial hollow perforated core, to dialysate at a rapid flow rate, characterized in that a plurality of toroidal flow fields of said dialysate are produced within said cartridge, and that said fibers are immersed in said toroidal flow fields, said toroidal flow fields being axially adjacent in the direction of their axis, adjacent ones of said fields having opposite directions of rotation.

4,312,758
EFFLUENT TREATMENT PROCESS

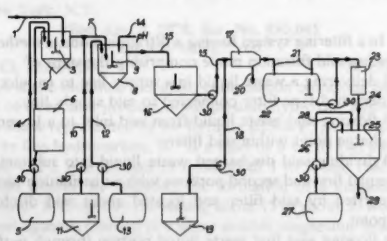
Yves Berton, Le puy Sainte Peparade, and Pierre Chauvet, Manosque, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 9, 1980, Ser. No. 157,786

Claims priority, application France, Jun. 14, 1979, 79 15273

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—709 **3 Claims**



1. A process for decontaminating the components of nuclear reactors by treating decontamination effluents, of the type containing in solution permanganate, phosphate and sulphate ions, as well as radio active manganeses, chrome and cobalt ions, comprising the successive steps of reducing the permanganate ions by adding hydrogen peroxide, and adding to the effluent a nickel salt selected from the group consisting of $NiSO_4$ and the nitrate $(Ni(NO_3)_2.6H_2O$, raising the alkalinity to a pH of 12 or above, separating the resulting precipitate and final acidification of the residual liquid phase to approximately a neutral pH to make it possible to discharge into the environment.

3. A process for the treatment of effluents according to claim 1, wherein hydrogen peroxide is added until the oxidation-reduction potential is adjusted to a value of approximately 550 mV, as compared to a calomel electrode.

4,312,759
PROCESS FOR TREATING AQUEOUS LATEX PAINT WASTE

Joseph C. Sherwood, and Brunbeck, Richard T., both of Reading, Pa., assignors to SCM Corporation, New York, N.Y.

Filed Dec. 12, 1980, Ser. No. 215,695

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—710 **2 Claims**

1. In a process for treating latex paint waste wherein said waste is flocculated with a resinous flocculating agent and allowed to settle until a flocculated slack sludge is formed, the improvement comprising:

heating said slack sludge with agitation to a

settling said heated slack sludge to form a leach-resistant consolidate fraction and a serum fraction, and

separating said fractions.

4,312,760
METHOD FOR THE REMOVAL OF FREE AND COMPLEX CYANIDES FROM WATER

Roy G. Neville, 1068 Eden Bower La., Redwood City, Calif. 94061

Filed Feb. 19, 1980, Ser. No. 122,169

Int. Cl.³ C02F *1/58*

U.S. Cl. 210—724 **17 Claims**

1. A process for the removal of cyanide from an aqueous solution comprising: treating said solution with sufficient soluble ferrous ion in the presence of soluble bisulfite ion at an acidic pH below about 6 compatible with maintaining said ferrous and bisulfite ions in said solution to react with the cyanide to produce Prussian blue and cyanide-free reaction products.

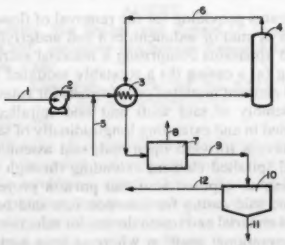
4,312,761
TREATMENT OF CLAY SLIMES

Wayne B. Gitchel, Rothschild, Wis., assignor to Zimpro-AEC Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 153,887, May 28, 1980, abandoned. This application Nov. 20, 1980, Ser. No. 208,700

Int. Cl.³ C02F *1/72*

U.S. Cl. 210—747 **9 Claims**



1. A method for dewatering slimes produced in mining and mineral processing operations, said slimes characterized as stably dispersed slurries of inorganic and organic matter in

water wherein a portion of said matter may be soluble, comprising the steps of:

(a) wet oxidizing the slime in the presence of an oxygen containing gas at a temperature of 150° to 320° C. and a pressure of 500 to 3200 psig, where the oxygen supplied meets or exceeds the oxygen demand of said slime, and wherein at least a portion of the water in the slime is evaporated;

(b) separating the finely-divided inorganic matter from the wet oxidized slime, obtaining a clarified water phase; and

(c) removing said separated inorganic matter for disposal or further dewatering followed by disposal.

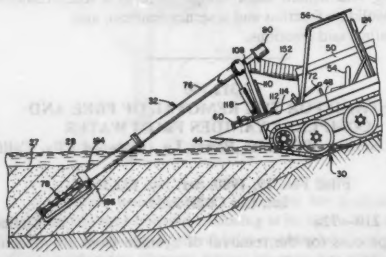
7. The method according to claim 1, in which the slime is a concentrated slurry taken from a tailing pond.

4,312,762

METHOD AND APPARATUS FOR REMOVING SEDIMENT OR OTHER FLOWABLE SOLID MATERIAL FROM A BED UNDERLYING A BODY OF WATER

Curtis D. Blackburn, Box 2741, Pikeville, Ky. 41501; Randall L. Blackburn, Box 87, and Dewey L. Adkins, Box 317, both of Betsy Layne, Ky. 41605

Filed Jan. 25, 1980, Ser. No. 115,220
Int. Cl.³ E02F *3/88*
U.S. Cl. 210—768 **18 Claims**



1. A method of utilizing a material extraction device for extracting a flowable solid material from a bed underlying a body of water wherein said device comprises a rotatable auger-like helix or spiralled material pick-up unit positioned longitudinally in a casing and having an exposed material pick-up end portion projecting longitudinally beyond a forward open end of said casing, said method comprising the step of inserting said device endwise into said bed to a depth where said end portion and at least the forward end of said casing are buried in said bed, and rotating said auger-like unit (a) to engage and pick up the material in said bed at a region spaced below the surface of said bed and (b) to feed it through said casing to an outlet opening in said casing without cutting away the surface layer of said bed and without entraining the picked-up material in said body of water before the picked-up material enters said casing.

3. An apparatus providing for the removal of flowable solid material, such as mud or sediment, in a bed underlying a body of water, said apparatus comprising a material extraction device including (a) a casing (b) a rotatably mounted shaft, and (c) a spiralled element mounted on said shaft for rotation therewith, the assembly of said shaft and said spiralled element being positioned in and extending longitudinally of said casing, said casing have a forward open end, said assembly of said shaft and said spiralled element extending through said open end and having an exposed lead end portion projecting forwardly beyond said casing for insertion into said bed, means mounting said material extraction device for selective displacement to an operational position where at least said lead end portion is buried in said bed and the rearward portion of said extraction device lies above said bed such that said extraction device extends endwise into said bed and projects upwardly from said bed at an angle thereto, and power means for rotating said assembly to provide for the extraction of said material from said bed at a region spaced below the surface of the bed and to further provide for the delivery of the extracted material through said casing to an outlet of said casing without cutting away the surface layer of said bed.

4,312,763

PROCESS FOR REMOVAL OF SOLIDS FROM SOLVENT REFINED COAL SOLUTIONS

Frederick L. Shea, Jr., Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 138,141
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—777 **10 Claims**

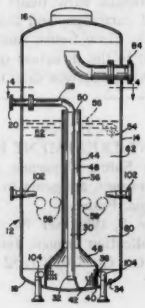
1. In a method for separating solids from a liquefied coal slurry resulting from the solvent refining of coal comprising passing said slurry through a pressure filtration system including a support means to receive a coating of filteraid material thereon capable of retaining solids from said slurry, the improvement which comprises utilizing as the filteraid material in said filtration system finely divided partially devolatilized coal particles wettable by the coal slurry and having a cake density no more than about 25 lb/ft³ (400.5 kg/m³), said partially devolatilized coal particles being prepared by flash heating finely divided thermally expandable coal particles to a temperature in the range of about 620° C. to about 1100° C. in an atmosphere containing oxygen.

4,312,764

FILTRATION SYSTEM WITH BI-FLOW FILTER

David G. Parshall, Northville, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 11, 1980, Ser. No. 186,133
Int. Cl.³ B01D *41/02*
U.S. Cl. 210—790 **8 Claims**



2. In a filtering system having a filtration mode, a method of operating said filtration mode comprising the steps of:

(1) delivering a waste liquid in a supply line to an inlet of a deep-bed type filter connected to said supply line,

(2) flowing said waste liquid from said inlet to a lower discharge point within said filter,

(3) dividing said discharged waste liquid into substantially equal first and second portions with a distribution plenum carried by said filter and located about said discharge point,

(4) flowing said first waste liquid portion through perforations provided in a lower portion of said plenum,

(5) flowing said second waste liquid portion through an open end provided in an upper portion of said plenum,

(6) flowing said first waste liquid portion from said perforations upwardly through filter media comprising a lower portion of a filter bed in said filter,

(7) flowing said second waste liquid portion from said open

end downwardly through filter media comprising an upper portion of said filter bed,

(8) entrapping particulate in said waste liquid during said flow through said filter bed portions, and

(9) discharging said waste liquid in a clarified condition through conduits centrally located within said bed,

said filtration system further characterized by having a rejuvenation mode, a method of operating said rejuvenation mode comprising the steps of:

(1) discontinuing said inflow and said discharge from said system,

(2) deforming said filter bed with a slurry circuit defined in part by a scrubber pump having an intake connected to a slurry discharge outlet of said filter by a slurry input line,

(3) separating said particulate from said filter media and suspending each in said waste liquid of said slurry by flowing said slurry into said filter with nozzle sets carried by said filter to create a spiral-like circulating flow path of said slurry within said filter, said nozzle sets connected to a discharge of said scrubber pump by a slurry outlet line

(4) backwashing said waste liquid and said particulate from said system with a backwash circuit defined in part by a cleaning receptacle having an inlet connected into said slurry input line and a second outlet to a drain line,

(5) reforming and purging said filter bed with a reformation and purge circuit defined in part by a media return line connecting said discharge of said scrubber pump to said filter inlet and a filter purge line connecting said filter discharge conduits to said intake of said scrubber pump, and

(6) purging said cleaning receptacle with a cleaning receptacle purge circuit defined in part by a purge line connecting said supply line to said second cleaning receptacle outlet and a by-pass line connecting said cleaning receptacle inlet to said filter inlet.

4,312,765

VISCOSIFYING AGENT

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 893,041
Int. Cl.³ C09K *7/00*
U.S. Cl. 252—8.5 C **36 Claims**

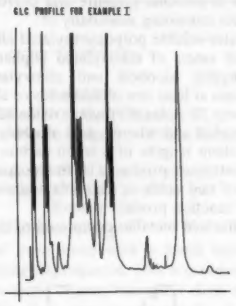
1. A silane-modified inorganic composition consisting essentially of a reaction product of magnesium hydroxide hydrogel and a silane represented by the formula $R_xSiR'_{4-x}$ wherein R is a C_1 to C_{20} hydrocarbon, R' is a halo or a C_1 to C_{20} alkoxy radical and x is an integer of from about 1 to 3; said reaction product formed by initiating the formation of a magnesium hydroxide hydrogel by contacting about 15 to about 30 weight percent aqueous solution of a water-soluble magnesium precursor agent capable of forming a magnesium hydroxide hydrogel with a sufficient amount of a base to cause substantially complete conversion of the magnesium precursor agent to the hydroxide; contacting the forming magnesium hydroxide hydrogel with from about 0.005 to 0.3 mole of said silane per mole of magnesium hydroxide; and causing the resultant aqueous suspension containing said reaction product to have a pH of at least about 10.

4,312,766

DERIVATIVES OF CIS-3-HEXENOL AND PROCESS FOR PRODUCING COMPOSITIONS OF MATTER CONTAINING CIS-3-HEXENAL AND PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES THEREOF

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel; Edward J. Granda, Englishtown; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 85,707, Oct. 17, 1979, Pat. No. 4,241,098. This application Jul. 17, 1980, Ser. No. 169,813
Int. Cl.³ D06M *13/16, 13/18, 13/20;* **A61K** *7/46*
U.S. Cl. 252—8.9 **1 Claim**



1. A process for augmenting or enhancing the aroma of a dryer added fabric softener article, comprising the step of intimately admixing with the outer coating of said dryer added fabric softener article a substance selected from the group consisting of:

A. A composition of matter consisting essentially of cis-3-hexenal, cis-3-hexenyl-cis-3-hexenoate, trans-2-hexenal, and cis-3-hexenol;

B. A composition of matter consisting essentially of cis-3-hexenal, cis-3-hexenyl-cis-3-hexenoate, cis-3-hexenyl formate and trans-2-hexenal;

C. A composition of matter consisting essentially of cis-3-hexenal, cis-3-hexenyl-cis-3-hexenoate, cis-3-hexenol, cis-3-hexenyl formate and trans-2-hexenal; and

D. Cis-3-hexenyl methyl ether.

4,312,767

LUBRICANT COMPOSITION CONTAINING FRICTION-MODIFYING AGENT AND ANTIWEAR AGENT

John H. Adams, San Rafael, and Donald D. Dexter, Concord, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 2, 1979, Ser. No. 8,913
Int. Cl.³ C10M *1/10*
U.S. Cl. 252—25 **6 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and 0.05 to 10 weight percent of a friction-modifying agent selected from dioleylhydrogen phosphite, pentaerythritol mono-oleate, synthetic sulfurized sperm oil, fatty amides containing 12 to 18 carbon atoms, and glycerol mono-oleate, and 0.1 to 20 weight percent of an alkali metal borate antiwear agent.

4. A lubricating oil additive concentrate comprising 0.25 to 90 weight percent of a friction-modifying agent selected from dioleylhydrogen phosphite, pentaerythritol mono-oleate, synthetic sulfurized sperm oil, fatty amides containing 12 to 18

carbon atoms, and glycerol mono-oleate, and 1.0 to 99 weight percent of an alkali metal borate antiwear agent.

4,312,768

SYNERGISTIC POLYETHER THICKENERS FOR WATER-BASED HYDRAULIC FLUIDS

Assadullah Nassry, Riverview; Jerrold F. Maxwell, Woodhaven; John W. Compton, Taylor; Edward J. Panek, Trenton, and Pauls Davis, Gibraltar, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 86,814, Oct. 22, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 140,329

Int. Cl.³ C09K *3/00;* **C10M** *3/04, 3/06, 3/16*

U.S. Cl. 252—32.7 E **15 Claims**

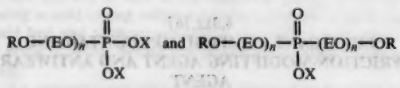
1. A hydraulic fluid or metalworking fluid concentrate capable of imparting to water the properties of a lubricant such as resistance to extreme pressure and corrosion inhibition, said concentrate consisting essentially of:

A. a water-soluble polyoxyethylated aliphatic ester consisting of esters of ethoxylated aliphatic monohydric and polyhydric alcohols and ethoxylated aliphatic acids wherein at least one of said acids or alcohols have about 5 to about 20 moles of ethylene oxide added per mole of acid or alcohol and wherein said alcohols and acids have carbon chain lengths of 8 to 36 carbon atoms and wherein said esters are produced by first polyoxyethylating at least one of said acids or alcohols and second, obtaining the ester reaction product thereof,

B. a sulfurized metallic compound of the formula:

wherein M is molybdenum or antimony and wherein R is selected from the group consisting of alkyl, aryl, alkylaryl radicals and mixtures thereof having 3 to 20 carbon atoms in the alkyl group and wherein the ratio of said water-soluble ester to said sulfurized metallic compound is from 5:1 to 2:1 by weight based upon the weight of the sulfur in said metallic compound,

C. a phosphate ester salt selected from the group consisting of



and mixtures thereof, wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl groups having about 6 to 30 carbon atoms or alkylaryl groups wherein said alkyl groups have 6 to 30 carbon atoms; X is selected from the residue of ammonia, an amine and an alkali or alkaline earth metal or mixtures thereof, n is a number from 1 to 50 and wherein the proportion of said phosphate ester to said sulfurized metallic compound is about 0.1:1 to about 2:1 based upon the weight of the sulfur in said metallic compound,

D. a polyether polyol thickener having a molecular weight of about 1000 to about 75,000, prepared by reacting ethylene oxide or ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing compound containing at least two active hydrogens and subsequently at least one alpha-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of 1 to about 20 percent by weight based upon the total weight of said thickener, and optionally

E. a corrosion inhibitor and a metal deactivator.

4,312,769

CONTINUOUS PROCESS FOR GREASE PREPARATION

Charles E. Pratt, Signal Mountain, Tenn., assignor to Chattem, Inc., Chattanooga, Tenn.

Continuation-in-part of Ser. No. 96,933, Nov. 23, 1979, and Ser. No. 201,272, Nov. 4, 1980, abandoned. This application Nov. 7, 1980, Ser. No. 203,869

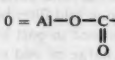
Int. Cl.³ C10M *5/12, 5/14*

U.S. Cl. 252—35 **22 Claims**

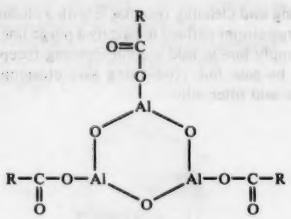
1. A continuous process for making an aluminum complex grease comprising the steps of simultaneously but sequentially:

(A) mixing a first dispersion of oxyaluminum acylate material with a second dispersion of carboxylic acid material in a first mixing zone to produce a substantially homogeneous product mixture,

(1) said oxyaluminum acylate material being characterized by the formula:



and by the formula



wherein R is selected from the group of radicals consisting of:

Type (A): aliphatical radicals each containing from 10 to 38 carbon atoms, and

Type (B): aromatic radicals each containing from 6 to 16 carbon atoms, and

wherein, in any given such oxyaluminum acylate material, the mole percent of the number of radicals of said Type (B) radicals ranges from about 40 to 95 with the balance up to 100 mole percent being said Type (A) radicals,

(2) said carboxylic acid material being characterized by the formula:

where R′ is selected from the group consisting of aliphatic radicals containing from 9 through 40 carbon atoms each and aromatic radicals containing from 6 through 28 carbon atoms each, and wherein in any given such carboxylic acid material the weight percent of said aromatic radicals ranges from and including 0 to about 70% with the balance up to 100 weight percent of all said radicals being said aliphatic radicals,

(3) the carrier liquid for each of said first and said second dispersions comprising an inert organic liquid having a viscosity at 100° F. of from about 35 to 50,000 SUS,

(4) the total amount of aluminum in said product mixture

ranging from about 0.01 to 2.0 weight percent based on total mixture weight, and

(5) the mole ratio of said total amount of aluminum to added said carboxylic acid material ranging from about 0.75:1.25 to 1.25:0.75,

(B) charging said product mixture into an elongated reaction zone,

(C) passing said product mixture through said reaction zone while maintaining said reaction zone at a temperature ranging from about 135° to 250° C., the residency time for said product mixture in said reaction zone being at least such that said oxyaluminum acylate substantially completely reacts with said carboxylic acid, thereby to form a product aluminum complex grease,

(D) removing said product grease from said reaction zone, and

(E) cooling said product grease.

4,312,770
THICK FILM RESISTOR PASTE AND RESISTORS THEREFROM

Ruey J. Yu, Flint, and Morris Berg, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

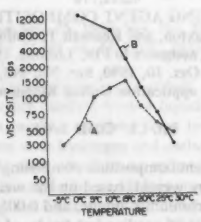
Filed Jul. 9, 1979, Ser. No. 55,970
Int. Cl.³ H01B 1/02
U.S. Cl. 252—514 **6 Claims**

1. A resistor composition comprising, in weight %, about 35 to 70% lead-borosilicate glass and the following un-prereacted noble metal and metal oxides: silver in the amount of about 10–20%, about 5–24% RuO_2, about 3–8% Sb_2O_3, about 8–12% CdO, up to about 4% Ta_2O_5 and up to about 2% of at least one thermistor powder selected from the group consisting of Cr_2O_3, CuO, NiO, ZnO and Mn_2O_3, said resistor composition being adapted to form fired resistors having stable electrical and physical properties.

4,312,771
VISCOUS LIQUID SOAP COMPOSITION

Noboru Matsuda, Joyo, Japan, assignor to Duskin Franchise Co., Ltd., Osaka, Japan

Filed Feb. 11, 1981, Ser. No. 233,454
Claims priority, application Japan, Dec. 26, 1980, 55/183801
Int. Cl.³ C11D 9/26, 10/04, 17/08
U.S. Cl. 252—107 **7 Claims**



1. A viscous liquid soap composition having a viscosity of 500 to 2500 cps measured at 15° C. and a viscosity-temperature correlation such that the viscosity is highest at room temperature or a temperature in close proximity to room temperature, said composition comprising 8 to 11 parts by weight, per 100 parts by weight of the total composition, of a potassium oleate soap, and 3.5 to 5.5 parts by weight, per 100 parts by weight of the total composition, of a higher saturated fatty acid potassium soap, and the total amount of said two soaps being 13.5 to 15.5 parts by weight per 100 parts by weight of the total composition, 5 to 7 parts by weight, per 100 parts by weight of the total composition, of a fatty acid monoethanolamide and 9 to 11 parts by weight, per 100 parts by weight of the total composition, of at least one polyhydric alcohol selected from the group consisting of propylene glycol and glycerin, with the remainder being water.

7. A liquid soad composition as set forth in claim 1 comprising:

Potassium oleate soap	10 parts by weight
Coconut fatty acid potassium soap	4.5 parts by weight
Coconut fatty acid ethanolamide	6 parts by weight
Propylene glycol	5.5 parts by weight
Glycerin	5 parts by weight
Fungicide	0.5 parts by weight
Pearling agent	1 part by weight
Coloring material	0.0001 part by weight
Perfume	0.1 part by weight
Water	to make 100 parts by weight.

4,312,772
BEARING MATERIAL

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Japan

Filed Aug. 14, 1979, Ser. No. 173,932
Int. Cl.³ C10M 7/02
U.S. Cl. 252—12.2 **8 Claims**

1. A bearing material comprising:

a porous material layer lined with a metal backing, said porous layer being impregnated with a mixture comprising 1–25% by volume of lead fluoride; 1–30% by volume of lead, a lead-tin alloy consisting essentially of 3–30% by weight of tin the balance being lead, or mixtures thereof; and the remainder being polytetrafluoroethylene, said lead fluoride and said lead, lead-tin alloy or mixture thereof being 2–35% by volume in total.

5. A bearing material comprising:

a porous material layer lined with a metal backing said porous layer being impregnated with a mixture consisting essentially of:

1–25% by volume of lead fluoride; 1–30% by volume of lead, a lead-tin alloy which contains 3–30% by weight of tin, or mixtures thereof; at least one additive selected from the group consisting of a metal sulfide, a metal oxide, a metal fluoride other than lead fluoride, graphite, lead iodide, glass fibers, carbon fibers, and a phosphate, said additive comprising 0.1–5% by volume in total; and the balance essentially polytetrafluoroethylene; the total of said lead fluoride, said lead, lead-tin alloy or mixture thereof and said at least one additive selected from the group consisting of said metal sulfide, said metal oxide, said metal fluoride, said graphite, said lead iodide, said glass fibers, said carbon fibers and said phosphate being 2.1–35% by volume.

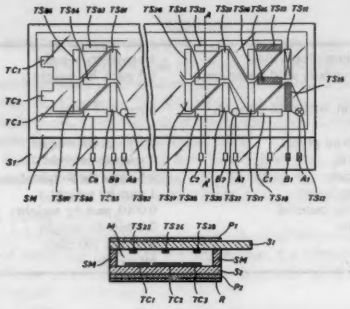
4,312,773
LIQUID CRYSTAL COMPOSITIONS

Shinichi Hibino, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

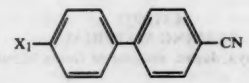
Filed Sep. 19, 1978, Ser. No. 943,671
Claims priority, application Japan, Sep. 29, 1977, 52-118291
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 252—299.63 **11 Claims**

1. A liquid crystal composition having a wide mesophase range encompassing room temperature, low threshold voltage, quick response time and satisfactory orientation suitable for use

in display devices employing a compact power cell comprising at least one compound represented by the formula (I):

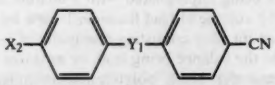


(I)



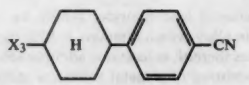
wherein X_1 is n-alkyl having 4 to 8 carbon atoms, n-alkoxy having 4 to 8 carbon atoms or p-n-alkyl-phenyl containing C_{4-8} n-alkyl, and at least one compound represented by the formula (II):

(II)



wherein X_2 is n-alkyl having 4 to 8 carbon atoms, n-alkylcarbonyloxy having 4 to 9 carbon atoms or p-n-alkylphenyl containing C_{4-8} n-alkyl, and Y_1 is a group represented by —COO— or —COS—, and further at least one compound represented by the formula (III):

(III)



wherein X_3 is n-alkyl having 3 to 8 carbon atoms.

4,312,774

IMMOBILIZATION OF RADWASTES IN GLASS CONTAINERS AND PRODUCTS FORMED THEREBY

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Catherine J. Simmons, Bethesda, Md.; Danh C. Tran, Rockville, Md.; Nicholas Lagakos, Silver Spring, Md., and Joseph Simmons, Bethesda, Md., assignors to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Silver Spring, both of, Md.

Continuation-in-part of Ser. No. 959,220, Nov. 9, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 34,567

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—629 **19 Claims**

1. Method of preventing the dissemination of toxic material to the environment which comprises forming an admixture of toxic material and glass packing in a hollow glass container of high silica content, or forming said admixture in a first container and thereafter depositing at least a portion of said admixture into a hollow glass container of high silica content, heating said glass container to drive off volatile material in said admixture from the container, to collapse the surfaces thereof and to seal the container whereby toxic material is entrapped and sealed within the collapsed glass container.

4,312,775

POLYETHER THICKENERS FOR AQUEOUS SYSTEMS CONTAINING ADDITIVES FOR INCREASED THICKENING EFFICIENCY

Edward J. Panek, Trenton, and Pauls Davis, Gibraltar, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 22, 1979, Ser. No. 86,839

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—316 **21 Claims**

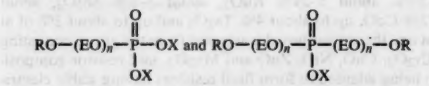
1. A polyether-based thickener for aqueous systems consisting essentially of in admixture:

A. a polyether having a moleculr weight of about 1000 to about 75,000 which is prepared by reacting (1) ethylene oxide or (2) ethylene oxicde and at least one lower alkylene oxide having 3 to 4 carbon atoms, with at least one active hydrogen-containing polyhydric alcohol initiator and at least one alpha-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 1 to about 20 percent by weight based upon the total weight of said polyether

and about 10 to about 35 percent by weight based upon the total weight of said polyether-based thickener of:

B. a mixture of about 20 to about 50 percent of a water-soluble amine and about 80 to about 50 percent of an ethoxylated phosphate ester, or an ethoxylated phosphate ester,

wherein said phosphate ester is selected from the group consisting of



and mixtures thereof, wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain aliphatic groups having about 6 to 30 carbon atoms, and aryl or alkylaryl groups wherein said arylalkyl groups have about 6 to 30 carbon atoms; X is selected from the group consisting of the residue of hydrogen, ammonia, an amine, an alkali or alkaline earth metal and mixtures thereof; and n ia a number from 1 to 50.

4,312,776

BLOWING AGENT COMPOSITIONS

Rishi R. Puri, Hauxton, and Kenneth T. Collington, St. Neots, both of England, assignors to FBC Limited, Hauxton, England

Filed Oct. 10, 1980, Ser. No. 195,741

Claims priority, application United Kingdom, Oct. 11, 1979, 35357/79

Int. Cl.³ C06D *5/04*

U.S. Cl. 252—350 **5 Claims**

1. A blowing agent composition comprising azodicarbonamide, 0.005 to 5% by weight, based on the weight of azodicarbonamide, of a chromium sulphate, and 0.005–1% by weight, based on the weight of azodicarbonamide, of at least one zinc compound selected from zinc salts and oxides.

4,312,777

EMULSIFIER COMPOSITION

Junichi Kawano, Sakura; Hisao Tsutsumi, Miyashiro, and Toshiaki Utsugi, Tokyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

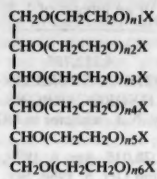
Filed Nov. 29, 1979, Ser. No. 98,687

Claims priority, application Japan, Dec. 14, 1978, 53-155509

Int. Cl.³ B01F *17/00*

U.S. Cl. 252—352 **5 Claims**

1. An emulsifier composition of the water-in-oil type consisting essentially of 65 to 99.5% by weight of a polyoxyethylene sorbitol fatty acid ester represented by the following formula:



wherein two to six X's each represent a saturated or unsaturated acyl group having 12 to 20 carbon atoms, the remainder of the X's being hydrogen atoms, and n1, n2, n3, n4, n5 and n6 are each integers of 0 to 10, whose sum ranges from 6 to 10; and 35 to 0.5% by weight of a multivalent metal salt of a saturated or unsaturated fatty acid having 12 to 22 carbon atoms.

4,312,778

MEMBRANE SEPARATION OF CATALYST METALS FROM AROMATIC ACID PRODUCTION

Jon J. Harper, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 1, 1980, Ser. No. 192,914
Int. Cl.³ B01D *13/00*
U.S. Cl. 252—410 **7 Claims**

1. The separation of ions of cobalt, manganese cerium or combinations of said metal ions from a residue from the manufacture of a benzene carboxylic acid wherein one or all of said metals is used as metal oxidation catalyst, which separation comprises extracting the residue with from 0.5 up to 6 weight parts of water per weight part of residue at a temperature of from 25° C. up to 100° C. and then at a temperature from 25° C. up to 100° C. contacting the extract solution or the suspension of insolubles in said solution with one side of a cation permeable fluoropolymer membrane whose other side is in contact with hydrochloric or hydrobromic acid.

4,312,779

RECOVERY OF CATALYSTS

Michael H. Quick, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 25, 1980, Ser. No. 190,774
Int. Cl.³ B01J *31/40, 31/20;* **C07C** *29/16;* **C01G** *55/00*
U.S. Cl. 252—411 R **11 Claims**

1. A process for the recovery of cobalt, rhodium or ruthenium metal complex catalyst from a liquid hydroformylation alcohol reaction product obtained from treatment of an olefinic hydrocarbon with hydrogen and carbon monoxide in the presence of said cobalt, rhodium or ruthenium metal complex catalyst at hydroformylation conditions comprising a temperature in the range of from about 50° to about 250° C. and a pressure in the range of from about 50 to about 300 atmospheres, which recovery process comprises treating said hydroformylation alcohol reaction product with an effective amount of gaseous anhydrous ammonia at a temperature in the range of from about 0° to about 100° C. and a pressure in the range of from about 5 to about 1000 p.s.i. to precipitate said cobalt, rhodium or ruthenium metal complex catalyst, separating said precipitated cobalt, rhodium or ruthenium solid metal complex catalyst precipitate from said hydroformylation alcohol reaction product, and recovering said cobalt, rhodium or ruthenium solid metal complex catalyst.

5. The process as set forth in claim **1** in which said rhodium metal catalyst complex comprises chlorodicarbonylrhodium dimer.

7. The process as set forth in claim **1** in which said cobalt metal catalyst complex comprises hexacobalthexadecacarbonyl.

4,312,780

REACTIVATION OF SPENT CHROMIA-ALUMINA CATALYST BY ZINC OXIDE DOPING

William J. Ambs, Swarthmore, and Maurice M. Mitchell, Jr., Wallingford, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 15, 1980, Ser. No. 187,307
Int. Cl.³ B01J *21/20, 23/92*
U.S. Cl. 252—412 **7 Claims**

1. The method of reactivating an aged chromia-alumina dehydrogenation catalyst which has reduced coke yield activity, which method comprises doping the aged catalyst with a minor amount of zinc oxide.

4,312,781

PROCESS FOR THE SEPARATION OF CATALYST FROM PRODUCTS OBTAINED IN THE HYDROCARBOXYLATION OF UNSATURATED NITRILES

Frederick A. Pesa, Aurora, and Thomas A. Haase, University Hts., both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Aug. 6, 1980, Ser. No. 175,804
Int. Cl.³ B01J *31/40;* **C07C** *121/38, 121/407*
U.S. Cl. 252—414 **50 Claims**

1. A process for the separation of a substantially active catalyst containing at least one of cobalt carbonyl and ruthenium carbonyl from an oxygenated cyanocompound product contained in a reaction mixture having a solvent selected from the group aromatics, substituted aromatics, esters, nitriles, and mixtures thereof comprising the steps of:

contacting the reaction mixture with an extracting hydrocarbon selected from the group consisting of alkenes or alkanes having from about 5 to about 20 carbon atoms to form a hydrocarbon/solvent conjugate solution, wherein the hydrocarbon is at least partially miscible with the solvent; and,

recovering the solvent phase from the hydrocarbon phase of the conjugate solution, whereby said active catalyst remains substantially in the solvent phase.

14. The process of claim **1** wherein the oxygenated cyanocompound is methyl-cyanopropionate.

32. A process for the separation of a substantially active catalyst containing at least one of cobalt carbonyl and ruthenium carbonyl from an oxygenated cyanocompound product contained in a reaction mixture having an alcohol solvent, comprising the steps of:

adding to the reaction mixture a replacement solvent selected from the group aromatics, substituted aromatics, esters, nitriles and mixtures thereof;

removing the alcohol solvent;

contacting the replacement solvent-containing reaction mixture with an extracting hydrocarbon selected from the group consisting of alkanes or alkenes having from about 5 to about 20 carbon atoms to form a hydrocarbon/replacement solvent conjugate solution, wherein the hydrocarbon is at least partially miscible with the replacement solvent; and

recovering the replacement solvent phase from the hydrocarbon phase of the conjugate solution, whereby said active catalyst remains substantially in the replacement phase.

4,312,782

TITANIUM HALIDE CATALYST FOR POLYMERIZATION

Robert Mink, and Ronald Epstein, both of Yonkers, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 12, 1980, Ser. No. 148,078
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **61 Claims**

1. A catalyst system comprising:

(a) an organoaluminum containing component; and
(b) a titanium halide containing component obtained by:
(i) copulverizing a halogen containing magnesium compound with an active hydrogen containing organic compound to produce a copulverized product;
(ii) reacting the copulverized product with an organometallic compound of a metal of Groups I and III of the Periodic Table to produce a reaction product;
(iii) copulverizing the reaction product with a complex of a first titanium halide compound and an electron donor to produce a solid reaction product; and
(iv) reacting the solid reaction product with a second titanium halide compound.

4,312,783

CATALYST FOR POLYMERIZATION OF OLEFINS

Hisaya Sakurai; Masayoshi Miya; Katsuhiko Takaya, and Haruyuki Yoneda, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1980, Ser. No. 169,234
Claims priority, application Japan, Jul. 24, 1979, 54-94060; Jul. 28, 1979, 54-96571
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **17 Claims**

1. A catalyst for polymerization of olefins comprising (A) a solid catalyst component obtained by reacting a titanium compound with an organoaluminum compound in the presence of an ether and a hydrocarbon solvent followed by heat treatment and (B) an organoaluminum compound, characterized in that said solid catalyst component has a hydrocarbyloxy group and is obtained by reacting a titanium compound of the formula

$$Ti(OR^1)_sX_{4-s} \quad (I)$$

wherein R^1 is a hydrocarbon residue having 1 to 20 carbon atoms; X is a halogen atom; and $0<s\leqq 4$, with an organoaluminum compound of the formula:

$$AlR^2_tY_{3-t} \quad (II)$$

wherein R^2 is a hydrocarbon residue having 1 to 20 carbon atoms; Y is a halogen atom; and $0<t\leqq 3$, in the presence of an ether and a hydrocarbon solvent to give a liquid material containing substantially no solid, or to give a solid titanium component (a), which is changed to a liquid material by adding a tetravalent titanium halide or a tetravalent titanium halide and an ether, or which is separated from the reaction mixture and then a tetravalent titanium halide and an ether are added thereto to give a liquid material, and heat treating said liquid material at a temperature of 70° to 180° C. with addition of a tetravalent titanium halide or without addition of a tetravalent titanium halide to give the solid catalyst component.

4,312,784

CATALYST AND PROCESS OF POLYMERIZATION OF ALPHA MONOOLEFINS

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 860,263, Dec. 13, 1977, Pat. No. 4,242,480. This application Jul. 28, 1980, Ser. No. 172,630
Int. Cl.³ C08F *4/02, 4/64*
U.S. Cl. 252—429 B **23 Claims**

1. A catalyst system for the polymerization of alpha-monoolefins comprising effective ratios of (A) a milled admixture of effective ratios of a tetravalent titanium halide, magnesium or manganous chloride, a first Lewis base, and a nonaromatic unsaturated hydrocarbon aliphatic or alicyclic compound, (B) a trihydrocarbylaluminum compound, optionally with a second Lewis base, and optionally including (C) a dihydrocarbylaluminum halide, wherein said titanium halide is represented by the formula $TiX_{4-n}R_n'$ wherein X is a halogen and is bromine, chlorine, or iodine, R' is an alkyl, cycloalkyl, aryl, aryloxy, alkoxy, or combination radical of 2 to 8 carbon atoms, and n is zero or an integer of 1, 2, or 3.

4,312,785

PROCESS FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Ji-Yong Ryu, Ramsey, N.J., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 28,015, Apr. 6, 1979, Pat. No. 4,243,827. This application Oct. 5, 1980, Ser. No. 194,158
Int. Cl.³ B01J *31/02*
U.S. Cl. 252—429 R **6 Claims**

1. A hydrocarbon conversion catalyst containing an ESR active Ti^{+3} species in combination with alumina which is prepared by:
(a) impregnating alumina with a complex of anhydrous titanium tetrafluoride and an organic compound selected from the group consisting essentially of methanol, isopropanol, 2-methoxyethanol and 2-methoxypropene; and
(b) heat treating the resulting impregnated alumina in an inert atmosphere.

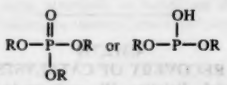
4,312,786

PROCESS FOR POLYMERIZING OLEFINS AND POLYMERIZATION CATALYSTS USED THEREFOR

Stanley J. Katzen, Cincinnati, and Louis J. Rekers, Wyoming, both of Ohio, assignors to National Petro Chemicals Corp., New York, N.Y.

Division of Ser. No. 931,598, Aug. 7, 1978, Pat. No. 4,252,926. This application May 30, 1980, Ser. No. 154,669
Int. Cl.³ C08F *4/22*
U.S. Cl. 252—430 **16 Claims**

1. A process for preparing an olefin catalyst which comprises:
(a) depositing an organophosphoryl chromium compound obtained by reacting chromium trioxide with an organophosphorous compound having the formula



wherein R is alkyl, aralkyl, cycloalkyl or hydrogen, but at least one R is other than hydrogen, upon a solid inorganic support material;
(b) heat activating said support material containing said organophosphoryl chromium product at a temperature above about 200° C. and below the temperature at which the structure of the support is impaired, for a period of time sufficient to promote the activity of the catalyst; and,
(c) combining the heat activated supported material of step (b) with triethyl borane which has been pretreated with hydrogen under reaction conditions sufficient to result in a catalyst which is capable of promoting the production of polyolefins of significantly higher melt index than attainable with the same catalyst except having been prepared with untreated triethyl borane which has not been pretreated by reaction with hydrogen.

4,312,787

COATED CATALYSTS CONTAINING HIGH LOADING OF ACTIVE PHASE, PARTICULARLY USEFUL IN THE PREPARATION OF MALEIC ANHYDRIDE

Serge R. Dolhyj, Parma, and Marc A. Pepera, Broadview Hts., both of Ohio, assignors to Standard Oil Company

Filed Dec. 17, 1979, Ser. No. 104,603
Int. Cl.³ B01J *27/14;* C07D *307/60;* B01J *31/02*
U.S. Cl. 252—435 **15 Claims**

1. A catalyst comprising an essentially inert, at least partially porous support of at least about 20 microns in diameter, said

support having an outer surface, and a catalytically active oxide material coating on said outer surface of said support which strongly adheres to said outer surface of said support wherein said oxide material consists essentially of the mixed oxides of vanadium and phosphorus, present in an amount greater than 50% to about 80% by weight of the combined support and oxide material wherein said oxide material is applied to said outer surface of said support by partially wetting said support with a liquid, contacting the partially wet support with a powder of said oxide material, and effecting said oxide coating.

4,312,788

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 57,623, Jul. 16, 1979, Pat. No. 4,250,020, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 20, 1980, Ser. No. 198,700

Int. Cl.³ B01J *27/08, 27/10, 23/62*

U.S. Cl. 252—441 **17 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component, and of a germaniun component.

4,312,789

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 68,278, Aug. 20, 1979, Pat. No. 4,256,566, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 15, 1980, Ser. No. 197,044

Int. Cl.³ B01J *27/08, 27/10, 23/62*

U.S. Cl. 252—441 **17 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component, and of a tin component.

4,312,790

AROMATICS PROCESSING CATALYSTS

Stephen A. Butter, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,343

Int. Cl.³ B01J *29/32*

U.S. Cl. 252—455 Z **25 Claims**

1. A method for preparing a noble metal-containing zeolite catalyst which comprises incorporating a noble metal in a cationic form with a zeolite after crystallization of the zeolite, prior to final catalyst particle formation and prior to any calcination or steaming of said zeolite, said zeolite being characterized by a silica to alumina mole ratio of at least 12 and a Constraint Index in the approximate range of 1 to 12.

2. The method of claim 1 wherein said noble metal is one or more members selected from the group consisting of ruthenium, rhodium, palladium, silver, osmium, iridium, platinum and gold.

4. The method of claim 1 wherein said zeolite is one or more members selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 and ZSM-48.

4,312,791

NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 67,084, Aug. 16, 1979, Pat. No. 4,243,826, which is a division of Ser. No. 936,428, Aug. 24, 1978, Pat. No. 4,207,425, which is a continuation-in-part of Ser. No. 786,744, Apr. 11, 1977, Pat. No. 4,110,201, which is a division of Ser. No. 621,718, Oct. 14, 1975, abandoned. This application Sep. 11, 1980, Ser. No. 186,063

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ B01J *23/60*

U.S. Cl. 252—466 B **13 Claims**

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % cadmium; wherein the platinum group, catalytically available cobalt, cadmium and alkali or alkaline earth components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state or in a mixture of these states; and wherein substantially all of the cadmium and alkali or alkaline earth components are present in an oxidation state above that of the corresponding elemental metal.

4,312,792

HYDROCARBON DEHYDROGENATION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 36,120, May 4, 1979, Pat. No. 4,231,897, which is a division of Ser. No. 947,906, Oct. 2, 1978, Pat. No. 4,193,863, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 27, 1980, Ser. No. 200,686

The portion of the term of this patent subsequent to Aug. 26, 1996, has been disclaimed.

Int. Cl.³ B01J *23/62, 23/82*

U.S. Cl. 252—466 PC **41 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at hydrocarbon dehydrogenation conditions, with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state, and of a cadmium component.

4,312,793

ELECTRICAL JOINT COMPOUND

Mitchell D. Charneski, 25900 Mulberry Dr., Southfield, Mich. 48034; James K. Kelley, 9188 Grafton Rd., Carleton, Mich. 48117, and Frank J. Gazdecki, 11243 Wynn Dr., Pinckney, Mich. 48169

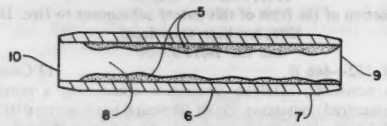
Division of Ser. No. 882,994, Mar. 3, 1978, which is a continuation-in-part of Ser. No. 648,453, Jan. 12, 1976, abandoned. This application Mar. 3, 1980, Ser. No. 126,179

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—513 **13 Claims**

1. A highly thermally conductive electrical joint compound for use in forming a compression joint within a metal tubular body connecting to at least one end of electrical power cable capable of carrying the heavy current in power distribution

systems, in which the tubular body is compressed into firm contact with the cable with sufficient force to substantially reduce the diameter of the cable end, in which the joint is characterized in that the joint has an electrical conductance at least substantially equal to an equal length of cable and in that the joint is capable of maintaining high conductance and mechanical strength over a very great number of thermal recyclings, said compound comprising a thermosetting hardenable resin containing a uniformly dispersed mixture of fine and



coarse metal particles, said fine particles being 200–500 mesh, said coarse particles being 10–100 mesh, the ratio by weight of coarse particles (C) to fine particles (F) being expressed by:

$C/F = 1/20$ to $1/1$,

the ratio by weight of all metal particles (P) to resin (R) being expressed by:

$P/R = 3/2$ to $6/1$.

4,312,794

ULTRA PURE TETRACHLOROETHYLENE DIELECTRIC FLUID

Henry A. Pearce, Stoneboro; Paul Voytik, and Edward J. Walsh, both of Hermitage, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 2, 1980, Ser. No. 136,650

Int. Cl.³ H01B *3/24*

U.S. Cl. 252—581 **15 Claims**

1. A transformer containing a dielectric fluid consisting essentially of tetrachloroethylene containing less than 100 ppm halohydrocarbons.

4,312,795

PAINT COMPOSITION COMPRISING POWDER PAINT DISPERSED IN AQUEOUS RESIN SOLUTION

Michiichi Taguchi, Funabashi; Kunio Funabiki, Yokohama; Masao Nakazima, Yokosuka; Hisao Nunokawa, Yokosuka; Tadashi Ikemi, Yokosuka; Masataka Kimura, Yokohama, and Naoki Shibata, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1980, Ser. No. 158,564

Claims priority, application Japan, Jun. 15, 1979, 54-74606

Int. Cl.³ C09D *3/26, 3/48, 3/733, 5/02*

U.S. Cl. 260—18 R **12 Claims**

1. A paint composition of an aqueous slurry type, comprising:

an aqueous solution of a water soluble carboxyl-containing resin; and

a powder paint uniformly dispersed in said aqueous solution, the particles of said powder paint having a mean particle size in the range from 1 micron to 100 microns, said powder paint being a mixture of at least two kinds of powder paints different in color and comprising a thermosetting resin as a vehicle;

said carboxyl-containing resin having a good affinity with said powder paint.

4,312,796

RESIN COMPOSITION

Toshiaki Kobayashi, Kamakura; Teruo Takeuchi, Yokohama, and Mamoru Nakamura, Takaoka, all of Japan, assignors to Nippon Zeon Co., Ltd., Japan

Filed Oct. 15, 1979, Ser. No. 85,054

Claims priority, application Japan, Oct. 19, 1978, 53-128867; Dec. 27, 1978, 53-161366

Int. Cl.³ C08K *5/09, 3/32*

U.S. Cl. 260—23 XA **4 Claims**

1. A method of molding an acrylonitrile-butadiene-styrene resin composition which does not substantially corrode molds, said composition being obtained by blending:

(I) 100 parts by weight of a resin composition composed of 50–80% by weight of (A) an acrylonitrile-butadiene-styrene copolymer resin and 95–20% by weight of (B) a vinyl chloride resin obtained by suspension polymerizing vinyl chloride or a monomeric mixture composed mainly of vinyl chloride in the presence of a cyclooolefin which is a chain transfer agent, with

(II) 0.5 to 15 parts by weight of a stabilizer selected from the group consisting of tribasic lead sulphate in admixture with lead stearate and dibasic lead phosphite in admixture with lead stearate and,

wherein the ratio of lead sulphate or phosphite to lead stearate is 1:10 to 15:1.

4,312,797

AQUEOUS COATING COMPOSITION

Tetsuo Aihara; Yasuharu Nakayama; Kuninosuke Nakanishi; Yoshio Yamashita, and Isao Toyomoto, all of Hiratsuka, Japan, assignors to Kansai Patent Co., Ltd., Hyogo, Japan

Filed Jun. 18, 1980, Ser. No. 160,739

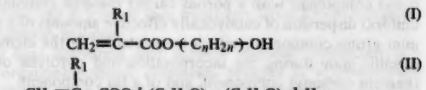
Claims priority, application Japan, Jun. 28, 1979, 54/80791

Int. Cl.³ C08L *91/00*; C09D *3/80, 5/02*

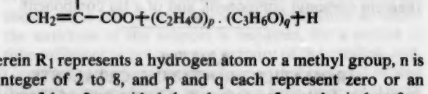
U.S. Cl. 260—23 AR **24 Claims**

1. An aqueous coating composition comprising a resin in a water-soluble or water-dispersible form as a firm-forming component, said resin being a copolymer of

(A) a fatty acid-modified acrylic monomer comprising the reaction product of an unsaturated fatty acid having at least two non-conjugated double bonds with a hydroxy-containing acrylic or methacrylic ester selected from compounds of the following formulae



(I)



(II)

wherein R_1 represents a hydrogen atom or a methyl group, n is an integer of 2 to 8, and p and q each represent zero or an integer of 1 to 8 provided that the sum of p and q is 1 to 8,

(B) an α,β-ethylenically unsaturated carboxylic acid, and

(C) an unsaturated monomer having a Q value, determined by the Q-e theory, of at least 0.1 and free from glycidyl group.

4,312,798

POLYURETHANE COATING SOLUTIONS OR DISPERSIONS

Jenoe Kovacs, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,086

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854192

Int. Cl.³ C08L *75/08*

U.S. Cl. 260—29.2 TN **12 Claims**

1. A polyurethane solution or dispersion comprising

(A) 30–80 percent by weight of a solvent or dispersion agent, and

(B) 70–20 percent by weight of the reaction product consisting of (a) 80–10 percent by weight of a polyester or polyether having a hydroxyl number greater than 20 and (b) 5–60 percent by weight of at least one hydroxyl compound containing acetylenic unsaturation and (c) 10–70 percent by weight of an organic polyisocyanate.

4,312,799
WATER SOLUBLE AMINE RESINS WHICH ARE MANNICH BASES

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jun. 18, 1980, Ser. No. 160,606
Int. Cl.³ C08L *61/26;* C08G *59/14*
U.S. Cl. 260—29.3 **7 Claims**

1. An amine resin which is soluble in water with the aid of an acid, produced by reacting a bisphenol with a stoichiometric deficiency of a diglycidyl ether of a bisphenol having a 1,2-epoxy equivalency of at least about 1.4 and a molecular weight of about 350 to about 5000, there being from 0.3 to 0.6 equivalents of epoxide in said diglycidyl ether per equivalent of phenolic OH in said bisphenol, then reacting the product with more than 3.5 moles of formaldehyde per mol of starting bishpenol to generate methylol groups, then reacting with a mixture of C_1–C_8 dialkyl amine and diethanol amine to produce a Mannich base, and then reacting said Mannich base with additional diepoxide in an amount of from 0.5 to 2 epoxy equivalents per epoxy equivalent in the initially used diepoxide.

4,312,800
ANODIC ELECTROCOATING OF ALUMINUM TO OBTAIN IMPROVED CORROSION RESISTANCE

Kenneth E. Jasenof, Skokie, and James W. Wichmann, Blue Island, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 14, 1978, Ser. No. 924,568
Int. Cl.³ C08K *3/10*
U.S. Cl. 260—29.6 E **9 Claims**

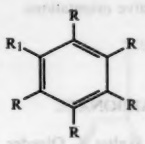
1. An aqueous anodic electrodeposition bath having a resin solids content of from about 3 to about 25% and particularly adapted to electrodeposit substantially clear coatings possessing superior corrosion resistance on aluminum substrates comprising, water having dispersed therein a carboxyl-functional polymer at least partially neutralized with a volatile base and from 0.08 to 0.5 part, per 1000 parts of said bath, of finely divided particles of pigment grade.

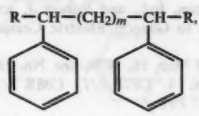
4,312,801
INTRODUCED IN PROCESSES FOR THE MANUFACTURE OF SILICON-BASED CURABLE COMPOSITIONS

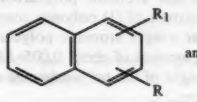
Jean-Michel Hiriart Bodin, and Jean-Claude Lahournere Irubetagoyena, both of St. Jean de Luz, France, assignors to Krafft, S.A., Andoain, Spain

Filed Apr. 15, 1980, Ser. No. 141,614
Claims priority, application Spain, Jan. 16, 1979, 476904
Int. Cl.³ C08K *5/09*
U.S. Cl. 260—31.2 R **2 Claims**

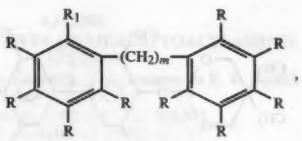
1. A silicon-based curable composition comprising a polysiloxane and 5–100 parts, per 100 parts of the polysiloxane, of at least one alkyl-aromatic compound, having a molecular weight greater than 200, selected from the group consisting of compounds of the formulae:







and



wherein each R, independently of each other R, is hydrogen, alkyl, alkenyl, halogen, haloalkyl, a nitrile group, an amine group, an amide group, an ether group or an ester group, m is an integer of from 1 to 25 and R_1 is C_nH_{2n+1} where n is an integer of from 1 to 30.

4,312,802
POLYMER COMPOSITIONS AND ARTICLES THEREFROM

Harry D. Anspon, Sewickley, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1977, Ser. No. 829,411
Int. Cl.³ C08K *5/01*
U.S. Cl. 260—33.6 AQ **1 Claim**

1. A thermoplastic resin composition capable of being extruded into thin sheet comprising:

an impact polystyrene material containing a minor amount of a high boiling plasticizer having melt toughness during extrusion and consisting essentially of a matrix of polymerized styrene containing a dispersed phase of insoluble particles, said particles having a matrix of polybutadiene rubber and at least one dispersed phase of polymerized styrene, said insoluble particles having styrene-polybutadiene graft copolymer linkages and also containing cross-linked polybutadiene rubber, said material being made by the polymerization of styrene with at least one polybutadiene rubber, said rubber about 4 to about 10% by weight of said styrene, the room temperature Izod impact strength of said material being at least 0.9 ft.-lb/in, the swelling index of said particles being in the range of 5 to 30, said particles having a weight average size in the range of 1–10 microns, said material being characterized in that said polybutadiene rubber has a distribution of polymerized butadiene isomer in the form of 19 to 22% vinyl, the balance being cis and trans 1,4 structures, said material being further characterized by values of elongation at failure of at least 35% and corresponding tensile strength at failure of at least 2,000 psi, said values being computed on the basis of measurements performed at room temperature on extruded sheet samples in the direction of extrusion and orientations perpendicular to said direction of extrusion, said sheet samples being isotropic

such that the minimum of said values is at least 60% of the larger value obtained from the respective orientations.

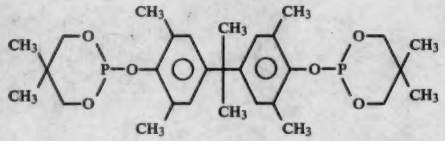
4,312,803

THERMALLY STABLE POLYCARBONATE COMPOSITIONS

Ronald L. Markezich; Gary L. Freimiller; Walter K. Olander, all of Mt. Vernon, Ind., and Robert J. Axelrod, Glenmont, N.Y., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 16, 1979, Ser. No. 21,563
Int. Cl.³ C07F *9/15*; C08K *5/52*
U.S. Cl. 260—45.7 PH **2 Claims**

2. A thermally stable aromatic polycarbonate composition comprising an admixture of (1) polymer consisting essentially of a high molecular weight aromatic polycarbonate and (2) a thermal stabilizing amount of about 0.005–1.0 weight percent based upon the weight of the polycarbonate of a bisphosphite having the structure:



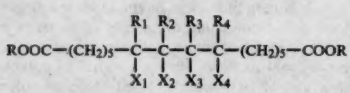
4,312,804

2,2,6,6-TETRAALKYL-4-PIPERIDYL ALCOHOL ESTERS OF TETRADECYLENE POLYCARBOXYLIC ACIDS AS LIGHT STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Ageo, and Toshihiro Shibata, Omiya, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

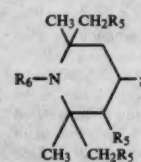
Filed Jul. 23, 1980, Ser. No. 171,633
Claims priority, application Japan, Jul. 23, 1979, 54-92620
Int. Cl.³ C07D *401/14, 491/113*; C08K *5/34, 5/35*
U.S. Cl. 260—45.8 NZ **28 Claims**

1. 2,2,6,6-Tetraalkyl-4-piperidyl alcohol esters of tetradecylene polycarboxylic acids having the general formula:



in which:

R is selected from the group consisting of



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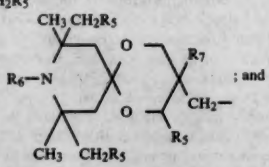

; and

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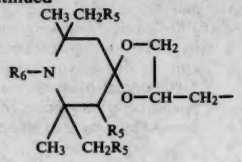


wherein:

R_5 and R_6 are selected from the group consisting of hydrogen and lower alkyl and hydroxyalkyl having from one to about six carbon atoms;

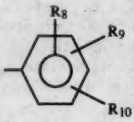
R_7 is lower alkyl having from one to about six carbon atoms;

R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen and methyl;

X_1 and X_3 are selected from the group consisting of hydrogen and COOR;

X_2 and X_4 are selected from the group consisting of COOR

and



wherein:

R_8, R_9 and R_{10} are selected from the group consisting of hydrogen, hydroxy, alkyl, and alkoxy having from one to about eighteen carbon atoms.

23. An olefin polymer composition having improved resistance to deterioration comprising an olefin polymer selected from the group consisting of polymers of alpha-olefins having from two to six carbon atoms and polystyrene, and a compound in accordance with claim **1**.

4,312,805

SELF-EXTINGUISHING POLYMER COMPOSITIONS

Guido Bertelli; Pierpaolo Roma, and Renato Locatelli, all of Ferrara, Italy, assignors to Montedison, S.p.A., Milan, Italy

Filed Jan. 10, 1978, Ser. No. 868,337
Claims priority, application Italy, Jan. 12, 1977, 19218 A/77
Int. Cl.³ C08K *3/32*
U.S. Cl. 260—45.9 NP **11 Claims**

1. Self-extinguishing polymeric compositions, comprising for 100 parts of a polyolefin as such or containing inert fillers:

(1) from 5 to 30 parts of ammonium or amine phosphate; and

(2) from 3 to 20 parts of one or more nitrogen containing organic compounds which, on heating in the presence of said ammonium or amine phosphate, decompose under formation of a non-drippic carbonaceous mass, said nitrogen containing compound being selected from the group consisting of:

(1) a mixture of a polyamide and melamine,

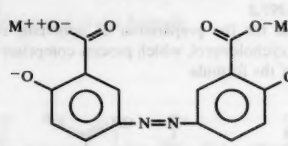
(2) a mixture of a polyamide and a reaction product of melamine/formaldehyde, (3) a mixture of a polyamide and a reaction product of melamine/toluylene-2, 4-diisocyanate, (4) a mixture of a polyamide and laurylamine, (5) a mixture of a polyamide and diethanolamine, (6) a mixture of a polyamide and hexamethylene-tetramine, (7) a mixture of a polyamide and tributylamine and (8) a mixture of a polyamide and a reaction product of urea/formaldehyde.

4,312,806
METHOD AND COMPOUNDS FOR TREATING INFLAMMATORY BOWEL DISEASE

Howard J. Lambert, Deerfield, and Barnett S. Pitzele, Skokie, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 2, 1981, Ser. No. 239,813
Int. Cl.[3] C07C *107/06;* A61K *31/655;* C09B *45/14*
U.S. Cl. 260—149 5 Claims

1. A compound of the formula:



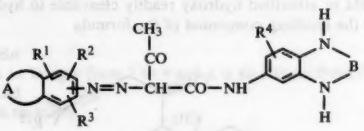
wherein M^{++} is a divalent alkali earth metal.

4,312,807
MONOAZO COMPOUNDS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Otto Fuchs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 88,853
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847285
Int. Cl.[3] C09B *29/00*
U.S. Cl. 260—154 3 Claims

1. A monoazo compound of the formula



wherein

A is —NH—CO—NH—, —NH—CO—CO—NH— or —NH—CO—NH—CO—;

B is —CO—CO—;

R^1, R^2 and R^3 each stands for hydrogen, chlorine, methyl, methoxy, ethoxy, nitro or —COOR in which

R is hydrogen, methyl or ethyl; and

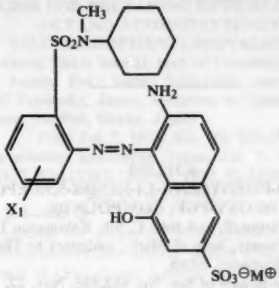
R^4 is hydrogen, chlorine, methyl, methoxy or ethoxy.

4,312,808
RED MONOAZO DYESTUFFS

Paul Lienhard, Frenkendorf, and Fabio Beffa, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Switzerland

Continuation-in-part of Ser. No. 720,621, Sep. 3, 1976, abandoned, which is a continuation of Ser. No. 624,883, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 389,511, Aug. 20, 1973, abandoned, which is a continuation of Ser. No. 102,062, Dec. 28, 1970, abandoned. This application Jan. 11, 1980, Ser. No. 111,301
Int. Cl.[3] C07C *107/04;* C09B *29/30*
U.S. Cl. 260—198 2 Claims

1. A red monoazo dyestuff of Formula I



(I)

wherein

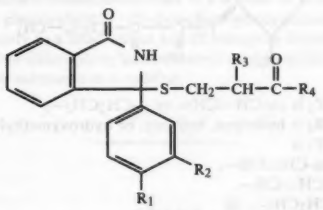
X_1 represents hydrogen or the methyl group, and $M^{\oplus}$ represents a colorless cation.

4,312,809
LACTAM DERIVATIVES OF MERCAPTOACYLAMINO ACIDS

Rudiger D. Haugwitz, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 31, 1980, Ser. No. 202,851
Int. Cl.[3] A61K *31/40;* C07D *401/12*
U.S. Cl. 260—325 PH 7 Claims

1. A compound having the formula

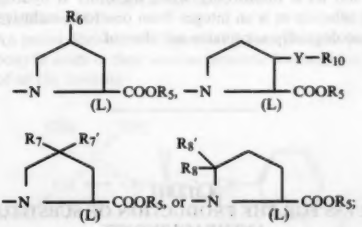


wherein

R_1 and R_2 are the same or different, and each is hydrogen, halogen, trifluoromethyl, or aminosulfonyl;

R_3 is hydrogen, alkyl, halogen or trifluoromethyl;

R_4 is



R_5 is hydrogen, alkyl, phenylalkyl, or a metal ion;

R_6 is hydrogen, hydroxy, alkyl, halogen, azido, amino, cycloalkyl, aryl, arylalkyl, carbamoyloxy, N,N-dialkylcarbamoyloxy, or —Y—R_9;

R_7 and R_7' are the same and each is halogen or —Y—R_{10}, or R_7 and R_7' together are =0, —O—$(CH_2)_m$—O— or —S—$(CH_2)_m$—S—;

R_8 is hydrogen and R_8' is phenyl, 2-hydroxyphenyl or 4-hydroxyphenyl or R_8 and R_8' together are =O;

R_9 is alkyl, aryl, arylalkyl, 1- or 2-naphthyl, or biphenyl;

R_{10} is alkyl, aryl or arylalkyl;
Y is oxygen or sulfur; and
m is 1 or 2.

4,312,810

2,5-INTER-O-PHENYLENE-3,4-DINOR-5,9α-EPOXY-9-DEOXY-PGF$_1$ COMPOUNDS

Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

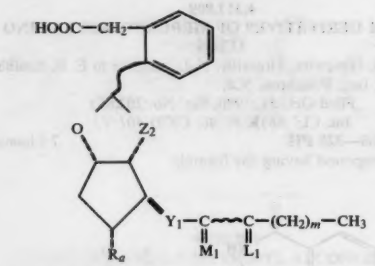
Continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,443

Int. Cl.^{3} C07D *311/02*

U.S. Cl. 260—345.2 **45 Claims**

1. A prostacyclin analog of formula X

X



wherein Z_2 is cis-CH=CH— or —CH_2CH_2—;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—;
wherein M_1 is α-R_5:β-OH or α-OH:β-R_5, whereis R_5 is hydrogen or methyl;
wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein m is an integer from one to 5, inclusive; or a pharmacologically acceptable salt thereof.

4,312,811

PROCESS FOR THE PRODUCTION OF SUBSTITUTED ANTHRAQUINONES

Jean Schoemans, and Edmond Bouillet, both of Brussels, Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Sep. 3, 1980, Ser. No. 183,826

Claims priority, application France, Sep. 13, 1979, 79 23065

Int. Cl.^{3} C07C *58/18*

U.S. Cl. 260—369 **14 Claims**

1. Process for the production of substituted anthraquinones comprising dehydrochlorinating the corresponding substituted ortho-benzoylbenzoic acid chloride.

4,312,812

PROCESS FOR THE MANUFACTURE OF CHOLESTEROL DERIVATIVES

Andor Fürst, Basel; Ludwig Labler, Allschwil, and Werner Meier, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 19, 1981, Ser. No. 226,293

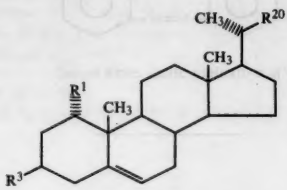
Claims priority, application Switzerland, Feb. 12, 1980, 1137/80

Int. Cl.^{3} C07J *7/00*

U.S. Cl. 260—397.2 **8 Claims**

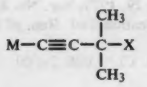
1. A process for the preparation of optionally-etherified 1α,25-dihydroxycholesterol, which process comprises reacting a compound of the formula

I



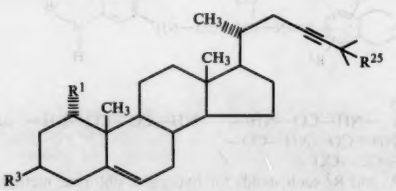
wherein R^1 and R^3 each is etherified hydroxy readily cleavable to hydroxy; and R^{20} is hydroxymethyl activated by esterification,
with a compound of the formula

II



wherein M is sodium, potassium, lithium or magnesium/2; and X is OM or etherified hydroxy readily cleavable to hydroxy, and in the resulting compound of the formula

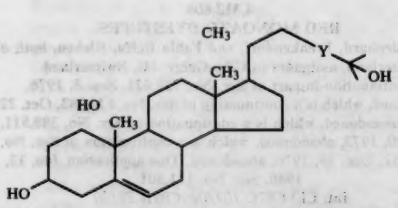
III



wherein R^1 and R^3 are as above; and R^{25} is hydroxy or etherified hydroxy readily cleavable to the hydroxy group, if desired, hydrolyzing said etherified hydroxy groups R^1-, R^3- and R^5- contained in the compound of formula III and reacting said compound of formula III or the product of its hydrolysis with a hydrogenation agent.

5. Compounds of the formula

V



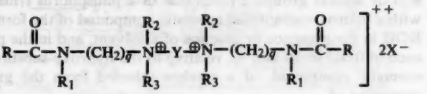
wherein Y is —C≡C— or cis- or trans—Ch=CH—.

4,312,813
BISQUATERNARY AMMONIUM COMPOUND

Martin K. O. Lindemann, Bridgewater, and Elvin R. Lukenbach, Somerset, both of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jun. 26, 1980, Ser. No. 163,121
Int. Cl.³ C09F 5/00
U.S. Cl. 260—404.5 8 Claims

1. A compound of the formula



wherein

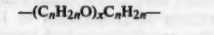
R is straight or branched chain alkyl, alkenyl, or alkaryl containing from about 8 to 30 carbon atoms and may be optionally interrupted by oxyalkylene groups containing up to a total of 20 carbon atoms;

R_1 is hydrogen or alkyl, alkaryl or hydroxyalkyl of from about 1 to 10 carbon atoms;

R_2 and R_3 are the same or different and are alkyl of from 1 to 6 carbon atoms, hydroxyalkyl of from 1 to 4 carbon atoms or alkaryl of from 1 to 10 carbon atoms;

q is an integer from 2 to 6;

Y is oxyalkylene of the formula



wherein

n is an integer from 2 to 4 and x is an integer from 1 to 16; and

X is an anion.

4,312,814
Patent Not Issued For This Number

4,312,815
PREPARATION OF A ZINC CHELATE HAVING IMPROVED STABILITY

David A. Wilson, Richwood; Druce K. Crump, Lake Jackson, and Freddie Griffin, Jr., Missouri City, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1980, Ser. No. 136,008
Int. Cl.³ C07F 3/06
U.S. Cl. 260—429.9 18 Claims

1. In the process of making the zinc chelate of N-(2-hydroxyethyl)iminodiacetic acid wherein the mole ratio of chelant-/zinc is substantially 1 and wherein a zinc salt, oxide or hydroxide is added to an aqueous solution of said chelant, the improvement which comprises adding to said aqueous solution sufficient ammonia, or ammonium hydroxide, to provide from about 1.75 to about 2.75 moles of NH_3 per mole of said chelant.

4,312,816
PROCESS FOR PREPARING OPTICALLY ACTIVE α-CYANO-3-PHENOXYBENZYL 2-(4-CHLOROPHENYL)ISOVALERATE

Kohichi Aketa; Yukio Suzuki, both of Toyonaka, Japan; Nobuo Ohno, Austin, Tex.; Isamu Nakayama, and Takashi Kato, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 7, 1978, Ser. No. 922,476
Claims priority, application Japan, Jul. 7, 1977, 52-81833; Oct. 7, 1977, 52-121242; Oct. 11, 1977, 52-122078
Int. Cl.³ C07C 121/75
U.S. Cl. 260—465 D 60 Claims

1. A process for preparing (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate, which comprises adding a seed crystal of (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate, (R)-α-cyano-3-phenoxybenzyl (R)-2-(4-chlorophenyl)isovalerate, or a mixture thereof, to a solution of (R, S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate in a solvent in which (R)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate is soluble and (S)-60-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate is substantially insoluble or soluble to a small extent, crystallizing (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate from the solution, and separating the crystalline (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate from the mother liquor.

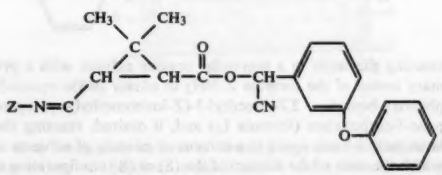
20. A process for preparing (S)-α-cyano-3-phenoxybenzyl (S)-2(4-chlorophenyl)isovalerate, which comprises crystallizing (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate from a solution of (R, S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate in a solvent in which (S)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate is soluble only to a small extent and (R)-α-cyano-3-phenoxybenzyl (S)-2-(4-chlorophenyl)isovalerate is soluble, in the presence of a basic substance as a catalyst.

4,312,817
IMINO DERIVATIVES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

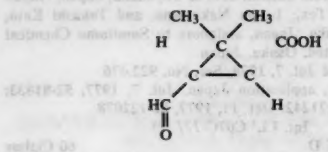
Filed Dec. 3, 1980, Ser. No. 212,566
Claims priority, application France, Dec. 17, 1979, 79 390843
Int. Cl.³ C07C 121/84
U.S. Cl. 260—465 D 10 Claims

1. An imino derivative of esters of 3-formyl-cyclo-propane-1-carboxylic acids in their various isomeric forms and mixtures thereof of the formula

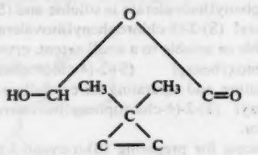


wherein Z is an organic residue of a primary amine of the formula $Z\text{-}NH_2$ and the acid moiety may have the cis or trans configuration and the alcohol moiety may have the R,S or RS configuration.

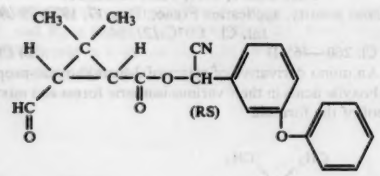
6. A process for the preparation of a compound of claim 1 comprising reacting 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylic acid in its trans form of the formula



or the cis lactone of 2,2-dimethyl-3-dihydroxymethyl-cyclopropane-1-carboxylic acids of the formula



in their racemic or optically active form with a deshydrating agent selected from the group consisting of dicyclohexyl carbodiimide and diisopropyl carbodiimide in a non-polar organic solvent in the presence of pyridine or 4-dimethylamino-pyridine to obtain respectively (cyclohexylamino)(cyclohexylimino)methyl 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylate or (isopropylamino)(isopropylimino)methyl 2,2-dimethyl-3-formylcyclopropane-1-carboxylate with the acid moiety having racemic or optically active, trans or cis structure, reacting one of the latter with (RS)α-cyano-3-phenoxy-benzyl alcohol in a non-polar solvent to obtain (RS)α-cyano-3-phenoxy-benzyl 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylate in racemic or optically active, cis or trans structure having the formula



reacting the latter in a non-polar organic solvent with a primary amine of the formula $Z\text{-}NH_2$ to obtain (RS)α-cyano-3-phenoxy-benzyl 2,2-dimethyl-3-(Z-iminomethyl)-cyclopropane-1-carboxylate (formula I_4) and, if desired, reacting the latter with a basic agent in a solvent or mixture of solvents in which the ester of the alcohol of the (S) or (R) configuration is more soluble than its diastereoisomer to permit after epimerization of the asymetric carbon of the alcohol moiety to obtain in a crystalline form only the ester corresponding to the configuration favoured by its insolubility which is either (S)α-cyano-3-phenoxy-benzyl 2,2-dimethyl-3-(Z-iminomethyl)-cyclopropane-1-carboxylate or (R)α-cyano-3-phenoxy-benzyl 2,2-dimethyl-3-(Z-iminomethyl)-cyclopropane-1-carboxylate with the acid moiety having the starting configuration.

4,312,818

PROCESS FOR PRODUCING TRIARYLPHOSPHITES

Rudolf Maul, Lorsch; Eberhard Otto, Lindenfels, and Horst Zinke, Ernsthofen, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 928,644, Jul. 27, 1978, abandoned. This application Dec. 13, 1979, Ser. No. 103,132

Claims priority, application Switzerland, Aug. 8, 1977, 9691/77

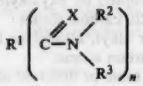
Int. Cl.³ C07F 9/141

U.S. Cl. 260—976 **4 Claims**

1. A process for producing a triarylphosphite of the formula $(RO)_3P$, in which R represents aryl or aryl substituted by one or more straight-chain or branched-chain alkyl, cycloalkyl, aryl or aralkyl groups, by reaction of a phosphorus trihalide with a hydroxy-substituted aromatic compound of the formula ROH in the presence or absence of a solvent, and in the presence of 0.005 to 10 mol %, relative to the hydroxy-substituted aromatic compound, of a catalyst selected from the group consisting of

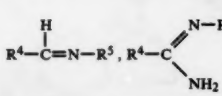
(a) a quaternary ammonium halide in which alkyl, cycloalkyl, aryl, alkaryl, aralkyl or alkaralkyl of 1 to 18 C atoms is linked to the N atom;

(b) an amide of a thiocarboxylic acid of the formula



in which, where n is 1, R^1 is phenyl, benzyl, naphthyl, cyclohexyl, cyclopentyl, pyridyl, hydrogen or alkyl having 1 to 13 C atoms; where n is 2, R^1 is phenylene, naphthylene, cyclohexylene or alkylene having 1 to 12 C atoms, or a direct bond; X is a sulfur atom; and R^2 and R^3 independently of one another are each a hydrogen atoms, phenyl, benzyl, cyclohexyl or alkyl having 1 to 12 C atoms, or R^2 and R^3 together are alkylene which is optionally interrupted by O or S atoms;

(c) an azomethine, (d) an amidine of the formulas respectively



in which R^4 is phenyl, benzyl, cyclohexyl, a hydrogen atom or alkyl having 1 to 8 C atoms, and R^5 is a hydrogen atom or phenyl, benzyl, cyclohexyl or alkyl having 1 to 18 C atoms, or a salt thereof;

(e) a sulfoxide, which is dimethyl sulfoxide, tetramethylene sulfoxide or bis-carboisooctyloxydimethyl sulfoxide;

(f) a sulfonium salt, which is trimethylsulfonium iodide, dimethylethylsulfonium iodide or triethylsulfonium iodide; and

(g) a phosphine oxide, which is the oxide of methyl-, ethyl-, hexyl-, dodecyl-, dimethyl-, ethylmethyl-, diphenyl-, dicyclohexyl-, dibenzyl-, phenylmethyl-, triphenyl-, tribenzyl-, tricyclohexyl-, trimethyl-, triethyl-, tripropyl-, tributyl-, triisobutyl, tripentyl-, trihexyl- or dimethylphenylphosphine.

4,312,819

AIR COOLING APPARATUS

Billy M. Leyland, 7537 N. 16th La., Phoenix, Ariz. 85021

Filed Nov. 18, 1980, Ser. No. 207,955

Int. Cl.³ B01F 3/04

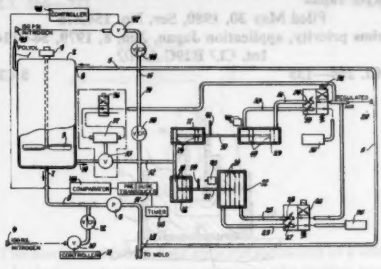
U.S. Cl. 261—152 **13 Claims**

1. An air cooling apparatus comprising in combination:

(a) an evaporative cooler including a cabinet having at least

one air inlet opening with a wettable fibrous pad mounted in said opening and having means for passing water through said pad, said cabinet including an air handler therein for drawing ambient air into said cabinet through said opening and said pad;

(b) a heat exchanger mounted in front of the wettable fibrous



pad of said evaporative cooler in overlaying relationship so that the ambient air will pass through said heat exchanger prior to passing through said wettable fibrous pad; and

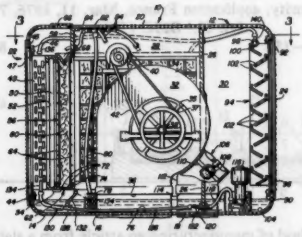
(c) means separate from said evaporative cooler for chilling water by evaporation and recirculatingly passing the chilled water through said heat exchanger means.

4,312,820

PROCESS AND APPARATUS FOR NUCLEATION CONTROL ADAPTED FOR REACTION INJECTION MOLDING OF CELLULAR PRODUCTS

John W. Arnold, West Bloomfield, and Steven L. Mills, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1980, Ser. No. 180,132
Int. Cl.³ B29D *27/00*; G01N *7/14*
U.S. Cl. 264—40.1 6 Claims



1. In a method of molding a polymeric article by the polymerization reaction of a liquid constituent in a mold, wherein said method pressurized gas is entrained in said liquid constituent prior to molding, the improvement comprising monitoring said gas entrainment in said constituent by

taking a sample thereof, changing the volume of said sample from a first volume to a different second volume;

measuring the sample pressure at said second volume;

comparing said measured pressure to the pressure corresponding to the desired amount of entrained gas in a like sample of said constituent processed in like manner; and

using said comparison to control the addition or withdrawal of gas from said constituent.

4,312,821

CERAMIC FORMING PROCESS

Michael Jarcho, Schodack, N.Y., and Michael Rossetti, Woburn, Mass., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,413
Int. Cl.³ C04B *33/28*
U.S. Cl. 264—43 18 Claims

1. In the process for producing a dense, polycrystalline sintered ceramic article comprising hydroxylapatite or a mixture of hydroxylapatite and whitlockite which comprises the steps of reacting calcium ion with phosphate ion in aqueous medium at a pH of about 10–12 to produce a gelatinous precipitate of a phosphate of calcium having a molar ratio of calcium to phosphorus in the approximate range of 1.50 to 1.67 separating said gelatinous precipitate from the reaction medium, heating said gelatinous precipitate up to a temperature of at least 1000° C. but below that at which appreciable decomposition of hydroxylapatite occurs and maintaining said temperature for sufficient time to effect the sintering and substantially maximum densification of the resulting product, the improvement wherein:

the water content of the gelatinous precipitate is adjusted to produce a homogeneous, pourable slurry having 5–25% solid content;

said slurry is cast in totally impervious mold the cavity surfaces of which are coated with an inert, water-immiscible lubricant having a viscosity such that a liquid film of lubricant is formed between the mold surface and the slurry at the drying temperature of the slurry;

the resulting molded slurry is dried at a temperature and relative humidity such that the rate of evaporation of water from the surface of the slurry is approximately equal to the rate of diffusion of water from the interior of the slurry to the surface thereof; and

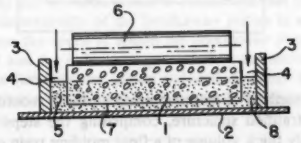
adsorbed lubricant is removed from the resulting dried green body prior to sintering.

4,312,822

CONTINUOUS PRODUCTION OF BUILDING ELEMENTS HAVING CELLULAR CORES

Alain Bonnet, Clermont, France, assignor to Saint Gobain Industries, Neuilly, France

Continuation of Ser. No. 12,716, Feb. 16, 1979, abandoned, which is a continuation of Ser. No. 575,387, May 9, 1975, abandoned, which is a continuation of Ser. No. 278,819, Aug. 8, 1972, abandoned. This application Mar. 7, 1980, Ser. No. 128,087
Claims priority, application France, Aug. 10, 1971, 71 29174
Int. Cl.³ B29D *27/04, 3/00*
U.S. Cl. 264—70 9 Claims



6. A continuous method of forming revetted materials having a core of conjoined organic pearls and a circumscribing coating of set, inorganic hydraulic cementitious material which comprises

continuously pouring a moving bed of a fluid inorganic hydraulic cementitious material,

partly immersing a preformed porous elongated platelike body of conjoined organic pearls for part of its thickness in said fluid cementitious material,

moving said platelike body with said fluid material,

said fluid cementitious material having a density greater than that of the body of conjoined organic pearls so that it exerts a buoyant force against said body,

moving said platelike body upwardly in a controlled way by exerting the buoyant force of said fluid material against said body,

applying a holddown force to said platelike body to hold it partly immersed in said fluid cementitious material against the buoyant force of said fluid material,

said conjoined pearls having interstices therebetween,

filling the interstices near the surface of said platelike body with said fluid material,

allowing said fluid material to set partly to overcome said buoyant force to hold the platelike body partly immersed,

releasing said holddown force from the platelike body,

applying an upper coat of said fluid material to the partly set fluid material and to the platelike body before the partly set fluid has hardened,

filling the upper surface interstices of said platelike body with said fluid, and

allowing said fluid cementitious material to set and harden about the platelike body.

4,312,823

METHOD OF MANUFACTURING A PLASTIC RECORD CARRIER HAVING A STRATIFIED STRUCTURE

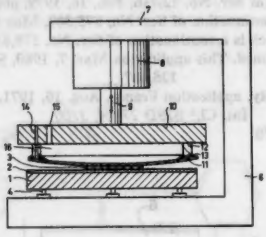
Hillebrand J. J. Kraakman; Egbert Broeksema, and Sjoerd Nijboer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 949,918, Oct. 10, 1978, abandoned, which is a division of Ser. No. 798,323, May 19, 1977, abandoned. This application Feb. 26, 1980, Ser. No. 124,878

Claims priority, application Netherlands, Mar. 14, 1977, 7702702

Int. Cl.³ B29D *17/00*; B29C *3/00*; B30B *3/00, 9/28*

U.S. Cl. 264—107 9 Claims



1. A method of manufacturing a plastic record carrier having a stratified structure, comprising the steps of placing a relatively thick volume of a fluid molding resin centrally on a minor portion of a surface of a mold having a curved information track, the resin thereby initially covering only said minor portion of the surface of said mold, deforming a flexible substrate into a convex form bulging toward said mold, pressing the substrate against the molding resin with a pressure force, the molding resin thereby being rolled out over the remaining portions of the surface of the mold with a circular fluid front, gradually changing the configuration of said substrate from said convex form to a planar form during the pressing step until the entire information track on the surface of the mold is covered by a relatively thin layer of the resin, and curing the layer of resin, whereby the resin attaches itself to the substrate.

4,312,824

PROCESS FOR MAKING CLOSURE CAPS HAVING LINERS

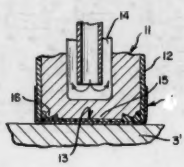
Fumio Mori, Yokohama; Junichi Itsubo, Hiratsuka; Gunji Matsuda, Isehara; Toru Hirano, and Hideki Sato, both of Hiratsuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 30, 1980, Ser. No. 154,875

Claims priority, application Japan, Jun. 8, 1979, 54-71148

Int. Cl.³ B29C *13/02*

U.S. Cl. 264—135 8 Claims



1. A process for the manufacture of a closure cap having a shell and a liner comprising the steps of positioning a melt in the shell of a thermoplastic resin composition containing 0.01 to 10% by weight based on the resin of a lubricant, pressing the melt by a punch maintained at a high temperature to spread the melt on the inner face of the shell, and press-molding the spread melt by a cooled punch to form a liner in which the thickness of the sealing peripheral portion of the liner is larger than the thickness of the central portion of the liner wherein blooming of the lubricant is caused to occur on the surface of said peripheral portion and is inhibited on the surface of said central portion.

4,312,825

METHOD AND DEVICE FOR CUTTING AND SHAPING A SHEET OR SLAB OF PASTE BASED IN PARTICULAR ON CLAYS FOR MAKING CERAMIC OBJECTS

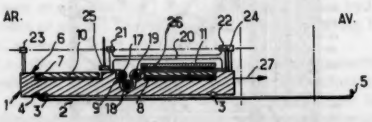
Sten Chronberg, 8, rue Leon Marchand, Arnieres-sur-Iton, France

Continuation of Ser. No. 952,148, Oct. 17, 1978, abandoned, which is a continuation of Ser. No. 775,622, Mar. 8, 1977, abandoned. This application Jul. 11, 1980, Ser. No. 167,916

Claims priority, application France, Mar. 11, 1976, 7607015

Int. Cl.³ B29C *17/10*

U.S. Cl. 264—153 8 Claims

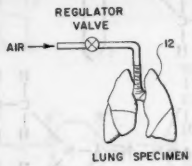


1. In a method of manufacturing an article from a slab of soft paste, placing a flexible sheet on an elastic support comprising a supple, compressible layer to provide a good absorption of cutting forces, placing the slab of soft paste on sid flexible sheet while the flexible sheet rests on the compressible elastic support, said flexible sheet being formed of a material which does not adhere to the slab of soft paste, then cutting through the slab while the latter is located above the compressible elastic support to provide therefrom a slab piece of predetermined configuration as well as slab trimmings, the cutting through the slab being carried out with a cutting action which does not cut the flexible sheet while the forces of the cutting action are absorbed by the compressible elastic support, and after cutting through the slab removing the slab trimmings and separating the slab piece from the flexible sheet.

4,312,826
METHOD FOR FABRICATION OF PHYSIOLOGICAL MODELS

David P. Colvin, Rte. 5, Apex, N.C. 27502

Filed Oct. 19, 1979, Ser. No. 86,421
Int. Cl.[3] B29C *1/02*
U.S. Cl. 264—221 6 Claims

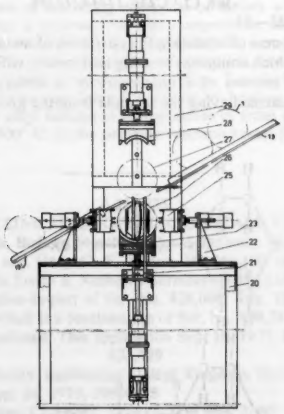


1. The method of fabricating an accurate model of a selected physiological organ comprising: injection of a casting material under pressure directly into the biological specimen to be molded and maintaining said pressure until desired physiological detail is obtained; digestion of the tissue of the organ in an appropriate chemical solution whereby a solid model of the interior of the organ is produced; casting of a mold about the solid model; removal of the thus cast mold from said model; casting a core within said mold out of a settable, dissolvable material; removing said core from said mold; coating said core with a settable material to form a reproduction of the interior of the physiological organ; and dissolving a core to form a hollow model whereby an improved demonstration and training device is produced.

4,312,827
METHOD AND APPARATUS FOR THE MANUFACTURE OF A BALL OF FOAM MATERIAL WITH EMBOSSED SURFACE

Horst Bokelmann, Bad Wildungen, Fed. Rep. of Germany, assignor to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany

Filed Mar. 14, 1980, Ser. No. 130,213
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910640
Int. Cl.[3] B29D *27/00;* B29C *15/00;* B44D *5/10*
U.S. Cl. 264—321 10 Claims

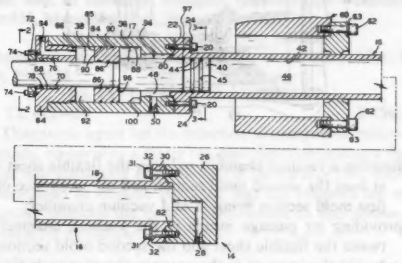


1. Method for embossing the surface of a ball of foam material with an embossed surface pattern corresponding to the surface marking of a leather ball, which comprises burning the pattern into all areas of the surface of the ball to be marked in a single operation by simultaneously radially applying each one of a set of heated burning tools to a predetermined region of the surface of the ball.

4,312,828
METHOD FOR OPENING DIE SECTIONS

William T. Flickinger, Marion, and Donald W. Staiger, Mount Gilead, both of Ohio, assignors to HPM Corporation, Mount Gilead, Ohio

Division of Ser. No. 970,102, Dec. 18, 1978, Pat. No. 4,240,781.
This application Feb. 25, 1980, Ser. No. 124,455
Int. Cl.[3] B29F *1/06*
U.S. Cl. 264—349 3 Claims



1. A method for separating the die sections following molding in a molding machine having a movable platen connected to one of the die sections, a traversing cylinder barrel having a fast traverse piston therein, the fast traverse piston being connected to the movable platen, at least one main cylinder having a main piston therein, and means connecting the main piston to the movable platen, said method comprising:

applying fluid under pressure to the main piston to retract the platen and die section connected thereto by a first distance,

providing an annular breakaway piston slidably received in the cylinder barrel and having a central opening extending through the breakaway piston, said opening being slidably received over a reduced diameter portion of the fast traverse piston,

admitting fluid under pressure within the cylinder barrel against the breakaway piston to retract the breakaway piston and the fast traverse piston which is in abutment therewith with mold breakaway force and through a second distance greater than the first distance, and then admitting fluid under pressure within the cylinder barrel against the fast traverse piston to retract the fast traverse piston independently of the breakaway piston at a speed higher than the speed at which the breakaway piston was retracted and for a distance greater than the second distance, the fast traverse piston reduced diameter portion sliding relative to the breakaway piston in the direction of retraction.

4,312,829
MOLDING METHOD

Fredric J. Fourcher, 614 Orchid, Corona Del Mar, Calif. 92625

Filed Dec. 10, 1979, Ser. No. 101,806
Int. Cl.[3] B29C *1/14*
U.S. Cl. 264—571 9 Claims

1. A method of molding a part comprising:

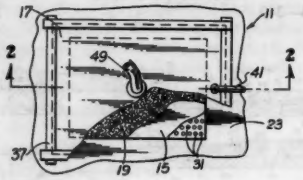
providing first and second mold sections having mold faces of the desired configuration with the second mold section being flexible and with at least one of said mold sections having a plurality of projections and recesses between the projections;

supporting the first mold section with the first mold face exposed;

supporting the second mold section with the mold faces being in confronting relationship to define a mold cavity between the mold faces;

engaging at least some of the projections with the mold face of the other of the mold sections with the recesses at least partially defining the mold cavity and the flexible second mold section following the contour of the mold face of the first mold section;

placing a flexible sheet over the second mold section;



forming a vacuum chamber utilizing the flexible sheet with at least the second mold section and the mold face of the first mold section being in said vacuum chamber;

providing air passage means in the vacuum chamber between the flexible sheet and the second mold section;

reducing the pressure in the vacuum chamber including the air passage means to less than ambient;

flowing a curable flowable material into the mold cavity;

allowing the material in the mold cavity to set to form the desired part; and

removing the second mold section from the part in the mold cavity.

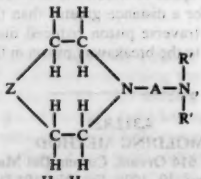
4,312,830

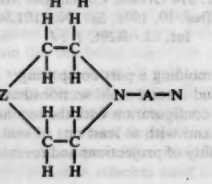
TERTIARY AMINO-SUBSTITUTED THIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 713,706, Aug. 12, 1976, Pat. No. 4,263,433.
This application Jun. 23, 1980, Ser. No. 161,989
Int. Cl.³ C23F *11/14, 11/16*
U.S. Cl. 422—12 **9 Claims**

1. The process of inhibiting corrosion which comprises treating a system with a tertiary amino-substituted thiazine having the formula selected from the group consisting of


(1)


(2)

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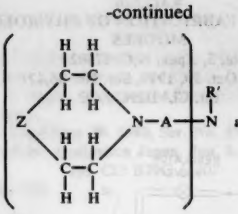
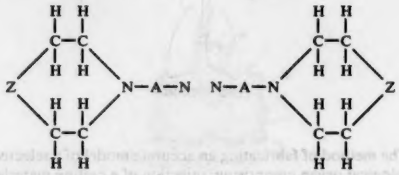

(3)

and


(4)

where Z is SO or SO_2, A is alkylene having 2 to 10 carbon atoms, R' is alkyl or hydroxyalkyl, N◯ represents a cyclic amine group and

represents a cyclic diamine group.

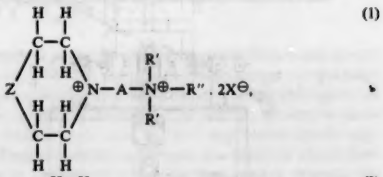
4,312,831

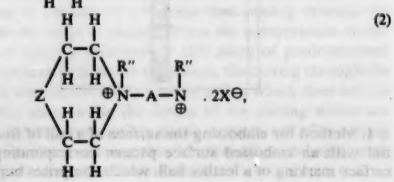
QUATERNARIES OF TERTIARY AMINO-SUBSTITUTED THIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 713,704, Aug. 12, 1976, Pat. No. 4,276,416.
This application Jul. 7, 1980, Ser. No. 166,437
Int. Cl.³ C23F *11/14, 11/16*
U.S. Cl. 422—12 **9 Claims**

1. A process of inhibiting the corrosion of metals in aqueous systems which comprises treating said system with a corrosion inhibiting amount of a quaternary of a tertiary amino-substituted thiazine having the formula from the group consisting of


(1)


(2)

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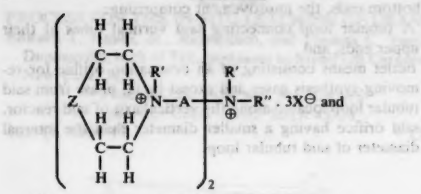
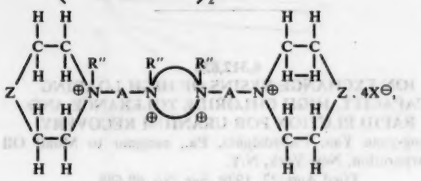


(4)



where Z is SO or SO_2, A is alkylene having 2 to 10 carbon atoms, R′ is alkyl or hydroxyalkyl, R″ is alkyl, alkenyl or alkynyl,

represents a cyclic amine group,

represents a cyclic diamine group and X is an anion selected from the group consisting of chloride, iodide, bromide, sulfate, sulfonate and carboxylate.

4,312,832

POLYMERIZATION OF AROMATIC NITROGEN HETEROCYCLIC COMPOUNDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 32,037, Apr. 23, 1979, Pat. No. 4,275,191. This application Aug. 12, 1980, Ser. No. 177,344

Int. Cl.³ C23F *11/04, 11/14*

U.S. Cl. 422—12 **10 Claims**

1. A process of inhibiting corrosion of metals which comprises treating a system with the composition obtained by polymerizing aromatic nitrogen heterocyclic compounds selected from the group consisting of quinoline, acridine, benzoquinoline, 2-methyl quinoline, pyridine, 2-methyl pyridine, 4-methyl pyridine and 2-butyl pyridine by heating said compounds with alkyl halides at temperatures of from about 250° C. to about 400° C. in the pressure reaction vessel for about 8 to 30 hours.

4,312,833

STERILIZING HYDROPHILIC CONTACT LENSES

David Clough, Bishops Stortford; David J. Drain, Welwyn Garden City, and Gary C. F. Ruder, Harlow, all of England, assignors to Smith & Nephew Pharmaceuticals, Ltd., England

Continuation-in-part of Ser. No. 826,000, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 630,261, Nov. 10, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,729

Claims priority, application United Kingdom, Nov. 14, 1974, 49354/74; Sep. 26, 1975, 39598/75

Int. Cl.³ A61L *2/16, 2/18;* C09K *3/00*

U.S. Cl. 422—30 **45 Claims**

1. A method of sterilizing a contact lens formed of a hydrophilic polymer which comprises contacting the lens with an aqueous solution of an iodophor selected from the group consisting of complexes of iodine with hydrophilic polymers and nonionic surface active agents, said solution containing a sufficient quantity of an alkali metal salt of formic acid to reduce the available iodine level of the solution to substantially zero within a period of from 30 minutes to 8 hours at a temperature of from 20° to 25° C.; the reaction products of the iodophor and the alkali metal salt being non-toxic and a non-irritant.

4,312,834

DIAGNOSTIC AGENT FOR THE DETECTION OF COMPONENT MATERIALS IN LIQUID AND PROCESS FOR PRODUCING SAME

Peter Vogel, Weinheim; Hans-Peter Braun, Hemsbach; Dieter Berger, Viernheim, and Wolfgang Werner, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,382

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910134

Int. Cl.³ G01N *33/52, 33/72, 33/92*

U.S. Cl. 422—56 **9 Claims**

1. Diagnostic agent for the detection of component materials in liquids, comprising a water resistant film comprising a film-former and containing a film opener in the form of fine, insoluble inorganic or organic particles, and the reagents for said detection, wherein the ratio of film opener to film former is 20:1 to 0.5:1 by weight.

4,312,835

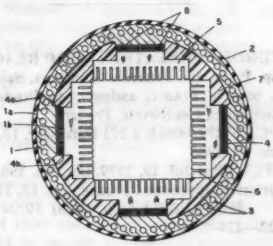
THERMAL CONTROL MEANS FOR LIQUID CHROMATOGRAPH SAMPLES

Bart J. Zoltan, Old Tappan, N.J., and Richard A. Leese, Monsey, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 21, 1980, Ser. No. 141,758

Int. Cl.³ G01N *1/14, 1/10, 35/02*

U.S. Cl. 422—70 **2 Claims**



1. In a liquid chromatographic sampling device having an automatic sample injector, the improvement comprising a thermal control sample containment means comprising:

(a) sample holder body of a heat conductive material having from one to a plurality of sample containment means and from one to a plurality of

(b) Peltier devices, said devices each having an active surface and a reactive surface and said sample holder body being in intimate contact with the active surface of each Peltier device adapted to provide cooling or heating of the samples being chromatographed and

(c) insulation between said sample holder body and said reactive surface of each Peltier device and each said reactive surface of each said Peltier device being in intimate contact with

(d) a heat exchange means.

4,312,836

APPARATUS FOR THE CONTINUOUS TREATMENT OF THE COMPOUNDS IN A CORROSIVE LIQUID

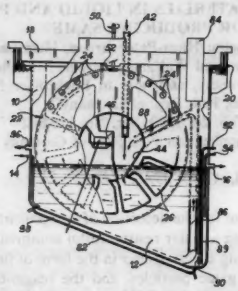
Jacqueline Auchapt-Tavenaux, Avignon; Pierre Auchapt, Bagnols sur Ceze; Henri Sauvage, Bagnols sur Ceze, and Maurice Tarnero, Bagnols sur Ceze, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 26, 1980, Ser. No. 210,612

Claims priority, application France, Dec. 18, 1979, 79 30952

Int. Cl.³ B01F *1/00*

U.S. Cl. 422—198 **13 Claims**



1. An apparatus for treating the compounds in a corrosive liquid comprising a fixed tank in which the liquid is placed, a horizontally axed rotary support which peripherally carries at least one bucket for receiving the compound to be treated, means for introducing the compound into the bucket, means for removing the compound from the bucket, means for rotating the rotary support about its shaft and means for guiding the rotary support during its rotation about its shaft, wherein the guidance means are entirely arranged within the tank, the guidance means and the driving means being positioned above a horizontal plane passing through the axis of the rotary support.

4,312,837

HYDROFORMYLATION LOOP REACTORS

Roger Papp, Paris, and Francois Mongenet, Saint Symphorien D'Ozon, both of France, assignors to Produits Chimiques Ugine-Kuhlmann, Courbevoie, France

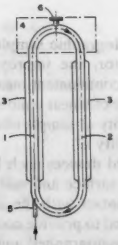
PCT No. PCT/FR79/00065, § 371 Date Mar. 13, 1980, § 102(e) Date Mar. 13, 1980

PCT Filed Jul. 13, 1979, Ser. No. 196,489

Claims priority, application France, Jul. 13, 1978, 78 20970

Int. Cl.³ B01J *4/00, 14/00, 19/24*

U.S. Cl. 422—224 **9 Claims**



1. In a hydroformylation reactor of the "loop" type comprising two parallel vertical tubes, one of said tubes having a supply tube at its base and acting as the ascending branch and the other of said tubes acting as the descending branch, and means connecting said vertical tubes to each other at their top and bottom ends, the improvement comprising:

a. A tubular loop connecting said vertical tubes at their upper ends, and

b. outlet means consisting of an evacuation orifice for removing synthesis gases and excess liquid phase from said tubular loop located along the vertical axis of said reactor, said orifice having a smaller diameter than the internal diameter of said tubular loop.

4,312,838

ION EXCHANGE RESINS OF HIGH LOADING CAPACITY, HIGH CHLORIDE TOLERANCE AND RAPID ELUTION FOR URANIUM RECOVERY

Tsoung-yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,688

Int. Cl.³ C22B *60/02*

U.S. Cl. 423—7 **5 Claims**

1. A method for the recovery of uranium from a carbonate lixiviant, comprising the steps of:

passing said lixiviant over a type I or type II anionic ion exchange resin to cause said resin to retain uranium predominantly in the form of a precipitate, and

recovering said precipitated uranium from said resin by contacting said resin with an aqueous acid solution having a pH no greater than 2.

4,312,839

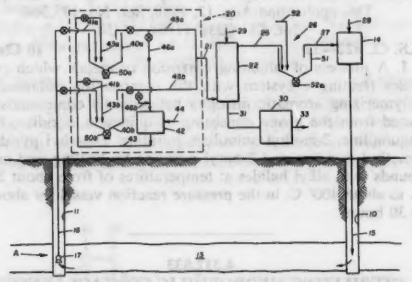
PROCESS FOR CONTROLLING CALCIUM IN A LEACH OPERATION

E. Thomas Habib, Jr., Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,258

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—12 **7 Claims**



1. In a leach operation wherein a leach solution is flowed through a calcium-based, uranium bearing ore to dissolve the uranium values from said ore and to carry said values to uranium recovery means wherein said uranium values are recovered from said leach solution, the method of controlling the calcium content of the leach solution comprising:

mixing a soluble fluoride with said leach solution after it has passed through said ore but before said leach solution is flowed through said uranium removal means;

precipitating calcium fluoride from said leach solution; and

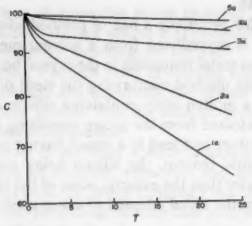
removing said calcium fluoride precipitate from said leach solution.

4,312,840

PROCESS FOR THE IN-SITU LEACHING OF URANIUM

Edward T. Habib, Jr., Richardson, and Thomas C. Vogt, Jr., Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,676
Int. Cl.³ C01G 43/00; E21B 43/28
U.S. Cl. 423—17 7 Claims



1. In the recovery of uranium from a subterranean deposit containing uranium associated with carbonaceous material and penetrated by injection and production systems, the method comprising:

(a) introducing into said deposit via said injection system an aqueous alkaline lixiviant which solubilizes uranium in said deposit, said lixiviant having a pH within the range of 7.5 to 10.0 and containing an alkali metal or alkaline earth metal hypochlorite in a concentration of at least 0.01 weight percent,

(b) displacing said lixiviant through said subterranean deposit to solubilize uranium therein,

(c) producing pregnant lixiviant containing uranium from said production system, and

(d) treating said pregnant lixiviant to recover uranium therefrom.

4,312,841

ENHANCED HYDROMETALLURGICAL RECOVERY OF COBALT AND NICKEL FROM LATERITES

William K. Tolley, Salt Lake City, Utah, and Pieter D. Rademaker, Tucson, Ariz., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 25, 1980, Ser. No. 162,970
Int. Cl.³ C01G 51/00, 53/00
U.S. Cl. 423—150 4 Claims

1. A hydrometallurgical process for the recovery of additional cobalt or nickel values from a lateritic ore via conjunct interaction of a calcium oxide additive and a quench step which comprises roasting said ore in a reductive roast at a temperature of from about 500° C. to about 1000° C. in contact with (1) at least one additive selected from the group consisting of from about 0.01 to about 10% of a hydrogen halide by weight of the ore, from about 0.01 to about 5% elemental sulfur by weight of the ore and from about 0.01 to about 10% of a sulfur compound, and (2) an additive consisting essentially of from about 1 to about 15% by weight of said ore of calcium oxide, wherein said calcium oxide is added to said ore before initiation of said reductive roast, cooling the reductively roasted ore and additives, quenching prior to extraction said cooled reductively roasted ore and additives with a quenching agent consisting essentially of water at a temperature less than about 100° C. and extracting cobalt or nickel from said quenched lateritic ore via an ammioniacal leaching solution.

4,312,842

PROCESS OF MANUFACTURE OF PHOSPHORIC ACID WITH RECOVERY OF CO-PRODUCTS

Eddie K. Wilson, Sr., 5877 Essex Ct., Apt. 2, and Silvio J. Spigolon, 7155 Riverdale Cove, both of Memphis, Tenn. 38138

Filed Feb. 12, 1980, Ser. No. 120,825
Int. Cl.³ C01F 1/00, 5/10; C01B 25/16
U.S. Cl. 423—178 8 Claims

1. A process for treating phospho-gypsum waste product produced the manufacture of phosphoric acid by the wet-acid process wherein phosphate rock is treated with sulfuric acid to produce said phospho-gypsum waste product, comprising:

(a) treating phospho-gypsum waste product from the production of phosphoric acid with sulfuric acid,

(b) calcining the acid treated phospho-gypsum product above about 900° to recover the sulfur dioxide values,

(c) utilizing the recovered sulfur dioxide values to produce sulfuric acid used to treat the phospho-gypsum waste product in Step (b), and

(d) treating the calcined phospho-gypsum waste product in an electric furnace to produce a melt containing calcium silicates and vapors containing recoverable sulfur dioxide values for use in producing sulfuric acid.

4,312,843

DICALCIUM PHOSPHATE DIHYDRATE HAVING IMPROVED MONOFLUOROPHOSPHATE COMPATIBILITY AND PROCESS FOR THE PREPARATION THEREOF

Henri Monty, Mt. Kisco; Robert Querido, Spring Valley, and Frances C. Benkwitt, Yonkers, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 26, 1979, Ser. No. 106,637
Int. Cl.³ C01B 25/32
U.S. Cl. 423—267 9 Claims

1. A process for preparing dicalcium phosphate dihydrate compositions having improved monofluorophosphate compatibility which comprises the steps of:

(a) reacting a slaked lime slurry with phosphoric acid to form a monocalcium phosphate solution;

(b) adding to said solution additional amounts of said lime slurry and from about 0.1% to about 1.0% pyrophosphoric acid, by weight of dicalcium phosphate dihydrate to be formed, to form a dicalcium phosphate dihydrate slurry having a pH ranging from about 4.9 to about 5.5;

(c) separating the dicalcium phosphate dihydrate from said slurry; and

(d) blending said dicalcium phosphate dihydrate with a stabilizing agent.

8. A dicalcium phosphate dihydrate composition having an improved monofluorophosphate compatibility comprising a mixture of a stabilizing agent with a dicalcium phosphate dihydrate product prepared by the steps of:

(a) reacting a slaked lime slurry with phosphoric acid to form a monocalcium phosphate solution;

(b) adding to the solution additional amounts of the slurry and from about 0.1% to about 1.0% pyrophosphoric acid, by weight of dicalcium phosphate dihydrate to be formed, to form a dicalcium phosphate dihydrate slurry having a pH ranging from about 4.9 to about 5.5; and

(c) separating the dicalcium phosphate dihydrate from the slurry.

4,312,844

TRIMETAPHOSPHATE COMPOUNDS OF TRIVALENT METALS

James E. Neely, Jr., Butler; Charlene A. Falleroni, Lower Burrell; Annette Moff, Latrobe, and Chia-Cheng Lin, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1980, Ser. No. 210,508

Int. Cl.³ C01B *25/44*

U.S. Cl. 423—314 **6 Claims**

1. A method for making trimetaphosphates comprising the steps of:

a. mixing thoroughly in approximately stoichiometric quantities

(1) an oxygen-containing compound of a trivalent element selected from the group consisting of iron and chromium capable of reacting with a phosphate compound to form a trimetaphosphate; and

(2) a basic phosphate compound capable of reacting with said compound to form a trimetaphosphate; and

b. heating the mixture at a sufficient temperature for a sufficient time to convert the reactants to a product which comprises a trimetaphosphate of said element.

4,312,845

METHOD OF PRODUCING AMORPHOUS SILICA OF CONTROLLED OIL ABSORPTION

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 74,226, Sep. 10, 1979, abandoned, which is a continuation of Ser. No. 869,347, Jan. 13, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 186,982

Int. Cl.³ C01B *33/187*

U.S. Cl. 423—339 **1 Claim**

1. A method of producing a synthetic amorphous silica useful as a polishing agent in a dentifrice comprising a solid phase comprising from 10 to 50% by weight of the dentifrice, of said synthetic amorphous silica and a liquid phase comprising water and a polyhydric alcohol humectant selected from the group consisting of sorbitol, glycerin and mixtures thereof; wherein fluoride is present in the dentifrice composition and the dentifrice has an RDA of less than 500 when the silica has 100% of the particles below 44 microns, an oil absorption greater than 60 cc/100 g and a BET surface area between 40 and 420 sq. m/g; as a flatting pigment in a paint coating composition wherein said flatting pigment has a 60 degree gloss of less than 8 when the silica has 100% of the particles below 10 microns and having an average particle size of from 2 to 5 microns, an oil absorption greater than 60 cc/100 g and a BET surface area between 40 and 420 sq. m/g; and as an adsorbent for polyol purification when the silica has at least 70% of the silica larger than 44 microns, an oil absorption of from 60 to 140 cc/100 g and a BET surface area greater than 60 sq. m/g when the synthetic silica contains up to 5% by weight of a metal cation adduct selected from the group consisting of aluminum, magnesium, zinc and calcium, said method comprising the steps of:

(a) subjecting an aqueous dispersion including finely divided silica and a sodium hydroxide to hydrothermal treatment at a temperature in the range of from about 138 to 210 degrees Celsius and for a period of time of from about 2.5 to 4.5 hours and sufficient to react the silica and said sodium hydroxide to form a reaction mixture of partly polymerized sodium silicate, said aqueous dispersion having a silica to sodium oxide weight ratio of at least 1.8:1;

(b) spray-drying said reaction mixture at a temperature of at least 204 degrees Celsius to form minute hollow spheres of sodium polysilicate having a bulk density of from 0.128 to 0.416 g/cc;

(c) reacting the polysilicate with a 5 to 15% sulfuric acid solution to form a synthetic amorphous silica; and

(d) filtering, washing and drying the synthetic amorphous silica.

4,312,846

METHOD OF SILICON PURIFICATION

Robert K. Dawless, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 41,892, May 24, 1979, Pat. No. 4,256,717. This application Sep. 9, 1980, Ser. No. 185,611

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ B01D *9/00*; C01B *33/02*

U.S. Cl. 423—348 **6 Claims**

1. A method for providing a bed of purified silicon crystals wherein silicon is crystallized from a solvent metal and the amount of solvent metal remaining in the crystal bed is reduced to a low level, the method comprising the steps of:

(a) providing a molten body containing silicon and at least one metal selected from the group consisting of tin, zinc, aluminum, silver and lead in a vessel having an upwardly removable first bottom, the silicon being present in an amount greater than the eutectic point of the silicon-metal combination, the metal adapted to act as a solvent for the silicon;

(b) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten phase;

(c) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;

(d) subjecting the solid phase to a melting action to melt a fraction of the solid phase for purposes of removing a substantial amount of metal-silicon combination adhering to said crystals;

(e) draining the molten phase from the solid phase to separate at least a fraction of the metal-silicon combination adhering to said crystals of silicon; and

(f) removing said crystals from the vessel by upwardly withdrawing said removable first bottom.

4,312,847

SILICON PURIFICATION SYSTEM

Robert K. Dawless, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 41,892, May 24, 1979, Pat. No. 4,256,717. This application Sep. 9, 1980, Ser. No. 185,596

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ B01D *9/00*; C01B *33/02*

U.S. Cl. 423—348 **10 Claims**

1. A method for providing a bed of purified silicon crystals wherein silicon is crystallized from a solvent metal and the amount of solvent metal remaining in the crystal bed is reduced to a low level, the method comprising the steps of:

(a) providing a molten body containing silicon and at least one metal selected from the group consisting of tin, zinc, aluminum, silver and lead, the silicon being present in an amount greater than the eutectic point of the silicon-metal combination, the metal adapted to act as a solvent for the silicon, said molten body containing Fe, Ti, Mn and Cr impurities at levels not greater than 1.5 wt.%, 0.2 wt.%, 2 wt.% and 0.4 wt.%, respectively, wherein intermetallic compounds containing these impurities, Si and said metal are avoided during subsequent crystallization;

(b) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten phase;

(c) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;

(d) subjecting the solid phase to a melting action to melt a fraction of the solid phase for purposes of removing metal-silicon adhering to said crystals; and

(e) draining the molten phase from the solid phase to separate at least a fraction of the metal-silicon combination adhering to said crystals of silicon.

4,312,848

BORON REMOVAL IN SILICON PURIFICATION

Robert K. Dawless, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 41,892, May 24, 1979, Pat. No. 4,256,717. This application Sep. 9, 1980, Ser. No. 185,597

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ B01D *9/00*; C01B *33/02*

U.S. Cl. 423—348 6 Claims

1. A method of removing boron impurity in a process for purifying silicon wherein silicon is crystallized from a solvent metal, the method comprising the steps of:

(a) providing a molten body containing silicon, the remainder aluminum and impurities, the silicon being present in an amount greater than the eutectic point of the silicon-aluminum combination;

(b) providing in the body a metal selected from the group consisting of titanium, vanadium and zirconium therein, the metal from the group forming a reaction product with boron and permitting the reaction product to be precipitated in the body, thereby removing boron from the body in this way;

(c) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten aluminum phase;

(d) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;

(e) subjecting the solid phase to a melting action to melt a fraction of the solid phase for purposes of removing a substantial amount of aluminum-silicon combination adhering to said crystals; and

(f) draining the molten phase from the solid phase to separate at least a fraction of the aluminum-silicon combination adhering to said crystals of silicon.

4,312,849

PHOSPHOROUS REMOVAL IN SILICON PURIFICATION

Raymond A. Kramer, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 9, 1980, Ser. No. 185,610

Int. Cl.³ B01D *9/00*; C01B *33/02*

U.S. Cl. 423—348 3 Claims

1. A method of removing phosphorus impurity in a process for purifying silicon wherein silicon is crystallized from a solvent metal, the method comprising the steps of:

(a) providing a molten body containing silicon, the remainder aluminum and impurities, the silicon being present in an amount greater than the eutectic point of the silicon-aluminum combination;

(b) treating said body to remove phosphorus therefrom by bubbling a gas therethrough, the gas containing a source of chlorine;

(c) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten aluminum phase;

(d) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;

(e) subjecting the solid phase to a melting action to melt a fraction of the solid phase for purposes of removing a substantial amount of aluminum-silicon combination adhering to said crystals; and

(f) draining at least a fraction of the melted material from said crystals of silicon.

4,312,850

SEMICONTINUOUS PROCESS FOR THE MANUFACTURE OF PURE SILICON

Josef Dietl, Neuötting; Claus Holm, Baldham, and Erhard Sirtl, Marktl, all of Fed. Rep. of Germany, assignors to Helictronic Forschungs- und Entwicklungs- Gesellschaft fur Solarzellen-Grundstoffe mbH, Berghausen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,498

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945070

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—350 8 Claims

1. A semicontinuous process for the manufacture of silicon from quartz sand by reduction with aluminum, comprising the steps of:

introducing quartz, batch-wise and while being stirred, into a closed reaction vessel containing molten aluminum sulphide in addition to aluminum;

periodically removing aluminum, enriched by the elemental silicon that forms, said aluminum then being slowly cooled to a minimum temperature of approximately 600° C., and being separated from the precipitating silicon; and

removing the aluminum oxide, formed during the reaction, from the aluminum sulphide melt, said aluminum oxide then being separated from adhering aluminum sulphide melt.

4,312,851

TREATMENT OF AMMONIA SYNTHESIS PURGE GAS

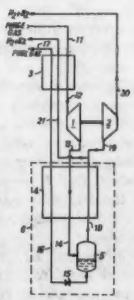
Wieslaw H. Isalski, 29 Grosvenor Rd., Sale, Cheshire, England, and Terence R. Tomlinson, 31 Bickerton Dr., Hazel Grove, Stockport, England

Filed Oct. 11, 1979, Ser. No. 83,827

Claims priority, application United Kingdom, Nov. 17, 1978, 44890/78

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 7 Claims



1. A method of synthesising ammonia by reacting a synthesis gas comprising nitrogen and hydrogen at superatmospheric pressure in a synthesis reaction zone with recycling of unreacting gas to said synthesis reaction zone, wherein fresh synthesis gas is introduced as a feed stream to a synthesis loop comprising said synthesis reaction zone and a recycle path leading from an exit of the synthesis reaction zone to an inlet thereto, and wherein a purge gas stream comprising unreacted hydrogen and nitrogen and impurities including methane and argon is withdrawn at superatmospheric pressure from said synthesis loop and subjected to the following steps (a) to (d) carried out in the sequence stated:

(a) first work expanding said withdrawn purge gas stream to a second superatmospheric pressure lower than the pressure in said synthesis loop,

(b) separating methane and argon from the work expanded

purge gas stream to form a gaseous product stream comprising nitrogen and hydrogen,

(c) recompressing at least a portion of said gaseous product stream from step (b) using work generated in step (a) and

(d) recycling at least a portion of the recompressed product from step (c) to said synthesis reaction zone, whereby to recycle hydrogen and nitrogen values thereto.

7. Apparatus for synthesising ammonia from a synthesis gas comprising nitrogen and hydrogen, said apparatus comprising a synthesis loop including a synthesis reaction zone and recycle conduit means leading from an exit of the synthesis reaction zone to an inlet thereto, first conduit means for introducing fresh synthesis gas to said synthesis loop, outlet means leading from said synthesis loop for withdrawal of a purge gas stream and means for treatment of said purge gas stream comprising expansion means in which purge gas at high pressure directly from said synthesis loop may be expanded with the performance of work and including an outlet for delivery of said purge gas stream after expansion, separation means for separating methane and argon contained in the expanded purge gas stream to form a stream enriched in hydrogen and nitrogen, second conduit means extending from the outlet of said expansion means to said separation means for transferring the expanded purge gas stream to said separation means, third conduit means extending from the outlet of said separation means to said compression means and fourth conduit means extending from an outlet of said compression means and connected to enable hydrogen and nitrogen values of said enriched stream to be recycled to the synthesis reaction zone, said compression means and said expansion means being coupled so that work generated in said expansion means is utilised in said compression means to compress the enriched stream.

4,312,852
NITRIC ACID RECONSTITUTION

John L. Dewey, Little Rock, Ark., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 61,298, Jul. 27, 1979, abandoned. This application Aug. 6, 1980, Ser. No. 175,925

Int. Cl.³ C01B *21/42*

U.S. Cl. 423—393 **7 Claims**

1. A process for the reconstitution of NO_X gases produced by the thermal decomposition of metal nitrates to nitric acid comprising the steps of:

a. contacting the NO_X gases at atmospheric pressure or 5–50 inches of water negative pressure in counter-current relationship in one or more packed columns with 50 to 60 percent nitric acid solution cooled sufficiently to provide acid solution exiting said one or more columns at a temperature below about 180° F. to remove as nitric acid, a major portion of the originally introduced NO_X values;

b. compressing the residual gases from step a to at least about 2 atmosphere absolute;

c. contacting the compressed gases from step b in a pressurized packed column with from about 50 to about 60% nitric acid to remove the residual NO_X values from the gas as HNO_3; and

d. recovering nitric acid as it accumulates.

4,312,853
RADIOIMMUNOLOGICAL DETERMINATION OF PROCOLLAGEN (TYPE III) AND PROCOLLAGEN PEPTIDE (TYPE III)

Rupert Timpl, Krailling, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft, Gottingen, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 30,042

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816841

Int. Cl.³ G01N *33/56, 33/58;* G01T *1/00;* G01N *33/54*

U.S. Cl. 424—1 **3 Claims**

1. Method for the radioimmunological determination of procollagen (type III) and procollagen peptide (type III), which method comprises reacting a sample having a unknown content of procollagen (type III) or procollagen peptide (type III) with a defined amount of radioactively tagged procollagen (type III) or procollagen peptide (type III) and a highly specific anti-procollagen (type III) serum or anti-procollagen peptide (type III) serum, separating the antigen anti-body complex formed, and measuring the radioactivity of the complex or of the super-natant liquid as a measure of the content of procollagen (type III) or procollagen peptide (type III) in said sample.

4,312,854
IMMUNOASSAY FOR THYROID STIMULATING HORMONE EMPLOYING FLORISIL ADSORBENT AS SEPARATING AGENT

Sara Derfler; Maksim Gur, both of Jerusalem, Israel, and Daniel B. Wagner, Raleigh, N.C., assignors to Ames-Yissum Ltd., Jerusalem, Israel

Filed Sep. 12, 1979, Ser. No. 75,059

Claims priority, application Israel, Sep. 13, 1978, 55565

Int. Cl.³ G01N *33/48;* G01T *1/00;* B65D *71/00*

U.S. Cl. 424—1 **17 Claims**

1. In an immunoassay method for determining thyroid stimulating hormone in a liquid sample,

(a) wherein said liquid sample is combined with a label-incorporated form of thyroid stimulating hormone and an antibody to thyroid stimulating hormone to form a liquid mixture containing a bound-species of said labelled thyroid stimulating hormone wherein such is bound by said antibody and a free-species of said labelled thyroid stimulating hormone wherein such is not bound by said antibody,

(b) wherein said bound- and free-species are physically separated, and

(c) wherein the amount of said label is measured in one of said separated species as a function of the presence or amount of thyroid stimulating hormone in said sample,

the improvement which comprises accomplishing said separation of said bound- and free-species by contacting said liquid mixture with an adsorbent comprised of granular, porous, synthetically activated magnesium silicate, whereby substantially all of said free-species is adsorbed thereto with substantially no adsorption of said bound-species and physically separating from said liquid mixture the adsorbent having said free-species adsorbed thereto.

4,312,855
COMPOSITIONS CONTAINING AMINOPOLYUREYLENE RESIN

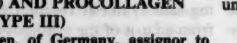
Paul S. Grand, South Bound Brook, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 308,883, Nov. 22, 1972, abandoned, which is a division of Ser. No. 90,154, Nov. 16, 1970, Pat. No. 3,726,815. This application Jan. 14, 1977, Ser. No. 760,619

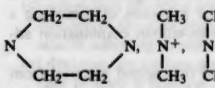
Int. Cl.³ A61K *7/06, 7/42, 31/74*

U.S. Cl. 424—59 **18 Claims**

1. A composition comprising a mixture of an aminopolyureylene resin having a molecular weight in the range of 300 to 100,000 and having the following repeating unit:



wherein X is NH, N-C_1 to C_{22} alkyl,



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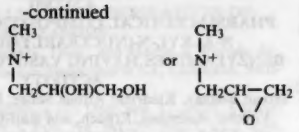


Y is O or S and n is 2 or 3; and an active material selected from the group consisting of (I) antimicrobials, (II) tarnish inhibitors, (III) ultra violet absorbers, (IV) fluorescent brighteners, (V) bluing agents and (VI) skin treating compounds, the weight ratio of resin to active material being effective to improve the properties of the active material and being selected from the range of 1:1 to 20:1.

4,312,856

BEVERAGE PRODUCT

Hans M. Korduner, Stockholm; Hans E. Gyllang, Täby, and Kjell Y. Ericson, Upplands-Väsby, all of Sweden, assignors to AB Pripps Bryggerier, Bromma, Sweden

Filed Mar. 14, 1980, Ser. No. 130,222

Claims priority, application Sweden, Feb. 15, 1980, 8001244

Int. Cl.[3] A61K *31/70, 33/06, 33/14, 33/30*

U.S. Cl. 424—145 **11 Claims**

1. Beverage product, especially for rapid replacement of liquid and carbohydrates in the human body during periods of extended heavy muscle work, characterized in that it consists of an essentially monosaccharide-free, hypotonic solution of soluble oligosaccharides having a degree of polymerization (DP) of up to 10 and/or polysaccharides and mineral salts selected from the group consisting of sodium chloride, potassium chloride, sodium bicarbonate, sodium dihydrogen phosphate and potassium hydrogen phosphate, in an amount of at the most 3 grams per liter beverage, which solution may contain suspended particles of insoluble polysaccharides, optionally also a minor amount of aroma substances conventionally used in such beverages.

4,312,857

NOVEL DERIVATIVES OF BETA-ENDORPHIN, INTERMEDIATES THEREFOR AND COMPOSITIONS AND METHODS EMPLOYING SAID DERIVATIVES

David H. Coy, New Orleans, and Abba J. Kastin, Metairie, both of La., assignors to The United States of America as represented by the Veterans Administration, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 807,129

Int. Cl.[3] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **20 Claims**

1. Hentriacospeptides represented by the formula

H-Tyr-X-Gly-Phe-Met-Thr-Ser-Glu-Lys-Ser-Gln-Thr-Pro-Leu-Val-Thr-Leu-Phe-Lys-Asn-Ala-Ile-Ile-Lys-Asn-Ala-Tyr-Lys-Lys-Gly-Glu-Y

wherein X is a chiral residue of a D-amino acid selected from the group consisting of D-leucine and D-lysine; Y is selected from the group consisting of hydroxy, amino, loweralkylamino, lower dialkylamino and lower alkoxy; and the pharmaceutically acceptable salts thereof.

4,312,858

ANTIBIOTIC KA-7038 AND COMPOSITIONS CONTAINING SAME

Takeo Deushi; Akio Iwasaki; Kazuhiro Kamiya; Toshimi Mizoguchi; Masahito Nakayama, all of Higashimurayama; Hisakatsu Itoh, Kawagoe, and Toshihito Mori, Higashimurayama, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

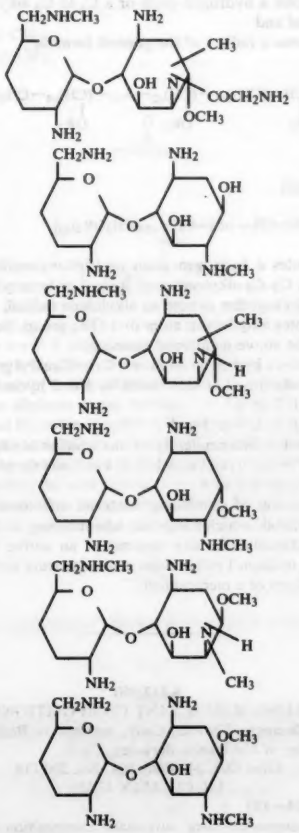
Filed Jul. 10, 1979, Ser. No. 56,313

Claims priority, application Japan, Jul. 13, 1978, 53-84537; Jun. 6, 1979, 54-69877

Int. Cl.[3] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—181 **5 Claims**

2. An antibiotic composition comprising (i) an antibiotically effective amount of an antibiotic substance KA-7038 selected from the group consisting of compounds having the following formulae, mixtures thereof and pharmaceutically acceptable acid addition salts thereof:



and (ii) a pharmaceutically acceptable diluent or carrier.

4,312,859
SISOMICIN DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND THEIR MEDICINAL USE

Uwe Petersen, Leverkusen; Karl G. Metzger, Wuppertal; Hans-Joachim Zeiler, Velbert; Peter Stadler, Haan, and Eckart Voss, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

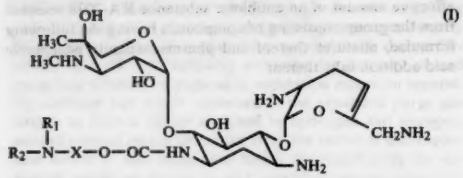
Filed May 8, 1980, Ser. No. 147,908

Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921973

Int. Cl.³ A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 18 Claims

1. A sisomicin derivative of the formula



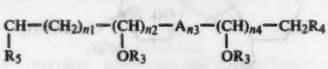
(I)

or a pharmaceutically acceptable salt thereof, in which

X denotes a straight-chain, branched or cyclic saturated or unsaturated aliphatic radical with 2 to 10 carbon atoms,

R_1 denotes a hydrogen atom or a C_1 to C_4 alkyl or benzyl radical and

R_2 denotes a radical of the general formula



in which

A denotes

R_3 denotes a hydrogen atom or triphenylmethyl, C_1–C_4-alkyl, C_2–C_4-alkylcarbonyl, formyl or benzoyl, or 2 radicals R_3 together denote an alkylidene radical,

R_4 denotes a hydrogen atom or a OR_3 group, (in which R_3 has the above-mentioned meaning)

R_5 denotes a hydrogen atom or a C_1 to C_4 alkyl group which is unsubstituted or substituted by 1 to 3 hydroxyl groups,

n_1 is 0, 1, 2 or 3,

n_2 is 0, 1, 2, 3, 4 or 5 and

n_3, n_4 and n_5 independently of one another are 0, 1 or 2,

the sum of n_1, n_2, n_3 and n_4 is 1, 2, 3, 4 or 5 and the total number of OR_3 groups is 1 to 6.

9. A method of combating bacterial infections in warm-blooded animals which comprises administering to the animals an antibacterially effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,312,860
LUNG SURFACTANT COMPOSITIONS

John A. Clements, Tiburon, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Oct. 24, 1980, Ser. No. 200,216

Int. Cl.³ A01N *57/26*

U.S. Cl. 424—199 9 Claims

1. A mammalian lung surfactant composition consisting essentially of dipalmitoyl phosphatidylcholine in admixture with a fatty alcohol.

4,312,861
PHARMACEUTICAL COMPOSITIONS CONTAINING N-ALKYL-N-(NUCLEARLY-SUBSTITUTED) BENZYLAMINES HAVING VASOTONIA-REGULATING ACTIVITY

Istvan Boksay, Kiedrich; Alfons Söder, Frankfurt-Schwanheim; Volkher Bollmann, Erbach, and Rolf-Ortwin Weber, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 555,104, Mar. 4, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,272

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1974, 2411406; Jun. 14, 1974, 2428625

Int. Cl.³ A01N *33/02, 57/00*; A61K *31/66, 31/135*

U.S. Cl. 424—220 2 Claims

1. A pharmaceutical composition having vasotonia-regulating activity and comprising as active ingredient, in association with a pharmaceutical carrier or excipient, an effective amount of aralkylamine of the formula:

wherein

R^1 is substituted phenyl, substitution of which is by: three or four alkyls, each having from 1 to 4 carbon atoms; the alkyls having a total of at most 6 carbon atoms, and any p-alkyl being separated from any other alkyl by a vacant m-position; 3,6-dialkyl, one alkyl having 4 carbon atoms, and the alkyls having a total of at most 6 carbon atoms; one bromine atom; or one nitro radical;

R^2

(a) has from 4 to 10 carbon atoms,

(b) is branched in the β-position (with reference to the nitrogen atom) only when there is also chain branching in the α-position,

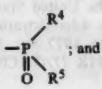
(c) has no more than three chain branchings,

(d) has a single methyl substituent or no substituent in the α-position (with reference to the nitrogen atom) and

is a member selected from the group consisting of C_{5-10} alkyl having from 5 to 10 carbon atoms in one chain and is, optionally, monohydroxy substituted; alkyl having from 4 to 10 carbon atoms and interrupted by an oxygen atom when substitution of substituted phenyl, R^1, is by three or four alkyls, and

monohydroxy-substituted alkoxyalkyl having from 4 to 10 carbon atoms;

R^3 is —H, alkyl having from 1 to 4 carbon atoms or alkylene having from 1 to 4 carbon atoms and substituted by dialkylphosphinyl of the formula



each of R^4 and R^5 is alkyl; together they have a total of from 2 to 6 carbon atoms;

or an acid addition salt thereof.

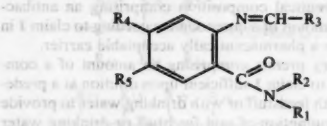
4,312,862

THERAPEUTICALLY ACTIVE DERIVATIVES OF BENZAMIDE

William P. Purcell, Memphis, Tenn., and Harlie A. Parish, Jr., Louisville, Ky., assignors to Debiopharm SA, Lausanne, Switzerland

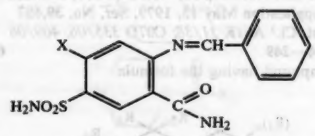
PCT No. PCT/CH79/00003, § 371 Date Sep. 17, 1979, § 102(e) Date Jul. 19, 1979, PCT Pub. No. WO79/00517, PCT Pub. Date Aug. 9, 1979
PCT Filed Jan. 10, 1979, Ser. No. 142,058
Claims priority, application Switzerland, Jan. 17, 1978, 472/78
Int. Cl.³ A61K *31/63, 31/24;* C07C *143/80, 103/28*
U.S. Cl. 424—228 5 Claims

1. A therapeutically active benzamide having the formula



in which R_1 and R_2, independently of each other, are hydrogen or a lower alkyl group, R_3 is a phenyl or lower alkyl or lower alkenyl group, R_4 is a halogen or a trifluoromethyl or nitro-group, R_5 is a sulphamoyl or carboxyl or carboxy-alkyl group, and the potassium salts of said derivative.

4. A therapeutically active benzamide having the formula



in which X is selected from the group of chlorine and fluorine, as well as the potassium salts thereof.

4,312,863

TREATMENT OF GLAUCOMA

Elijah H. Gold, West Orange, and Wei Chang, Livingston, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 137,935, Apr. 7, 1980, which is a continuation-in-part of Ser. No. 89,077, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 944,516, Sep. 20, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 174,988
Claims priority, application South Africa, Sep. 13, 1979, 79/4872
Int. Cl.³ A61K *31/60, 31/165*
U.S. Cl. 424—230 4 Claims

1. A method for treating glaucoma and for lowering intraocular pressure which comprises topically applying to the glaucomatous eye an intraocular pressure lowering effective amount of (−)-5-{(R)-1-hydroxy-2-[(R)-1-methyl-3-phenylpropyl)-amino]ethyl}salicylamide or a pharmaceutically acceptable salt thereof, substantially free from its stereoisomers, together with a vehicle suitable for ophthalmic use.

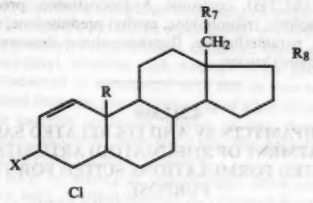
4,312,864

BRANCHED CHAIN AND CYCLOALIPHATIC ESTERS OF THE ANDROSTANE AND DESTRANE SERIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Lambert J. W. M. Tax, Macharen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 852,326, Nov. 17, 1977, abandoned. This application Feb. 12, 1980, Ser. No. 120,598
Claims priority, application Netherlands, Nov. 26, 1976, 7613248
The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.
Int. Cl.³ A01N *45/00;* A61K *31/56*
U.S. Cl. 424—238 14 Claims

1. A compound of the formula:

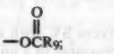


where

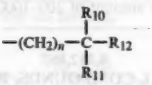
R is H or CH_3;

R_7 is H or CH_3;

R_8 is



R_9 is



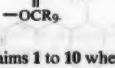
where n=0, 1, or 2;

R_{10} is C_1 to C_{10} alkyl;

R_{11} is H or C_1 to C_{10} alkyl;

R_{12} is an aliphatic group having 1 to 18 carbon atoms, or R_{10} and R_{12} taken together with the carbon atom to which they are attached form a C_7 to C_{12} cycloaliphatic group with the proviso that the total number of carbon atoms in the carboxylic acid residue is 8 to 20; and

X is selected from the group consisting of =O, OH, and



11. The compound of claims 1 to 10 wherein X is =O and R is CH_3.

4,312,865

MEDICATION HAVING PENETRATION THROUGH CUTANEOUS SURFACES INTO ARTICULAR AND MUSCULAR AREAS

Murrill M. Szucs, 50 W. State St., Akron, Ohio 44308

Filed Jul. 7, 1980, Ser. No. 166,307
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—243 14 Claims

1. A therapeutic composition for the relief of intra-articular

and intra-muscular discomfort beneath cutaneous surfaces, comprising:

(a) from about 25 to less than 50 parts by weight of a percutaneous penetrant selected from sulfoxides having the following formula:

where R and R′ are aliphatic hydrocarbon radicals having from 1 to 5 carbon atoms and may be the same group;

(b) from about 0.25 to about 0.75 parts by weight of a topical anesthetic compound; and

(c) from about 0.005 to about 0.10 parts by weight of at least one physiologically active glucocorticoidal agent selected from the group consisting of: adrenocoricotropin hormone (ACTH), cortisone, hydrocortisone, prednisone, prednisolone, triaminolone, methyl prednisolone, meprednisone, paramethasone, fluprednisolone, dexamethasone, and betamethasone.

4,312,866

USE OF RIFAMYCIN SV AND ITS RELATED SALTS IN THE TREATMENT OF RHEUMATOID ARTHRITIS, AND RELATED FORMULATIONS SUITED FOR THE PURPOSE

Innocenzo Caruso; Franco Montrone, both of Milan, and Luigi Molteni, Malnate, all of Italy, assignors to Dr. L. Zambeletti S.p.A., Milan, Italy

Filed Jul. 7, 1980, Ser. No. 166,587

Claims priority, application Italy, Jul. 10, 1979, 24227 A/79; Jun. 13, 1980, 22778 A/80

Int. Cl.³ A61K *31/395;* **C07D** *498/08*

U.S. Cl. 424—244 **19 Claims**

1. The salt of rifamycin SV with a basic aminoacid.

5. The method of treatment of a joint affected by rheumatoid arthritis, which consists of administering to a patient affected with a form of rheumatoid arthritis in a joint by means of intra-articular injections into the affected joint of rifamycin SV or salt thereof in the amount of 200–1000 mgs per injection.

4,312,867

ANTIBACTERIAL COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Norman H. Rogers, Rudgwick, and Peter J. O'Hanlon, Redhill, both of England, assignors to Beecham Group Limited, England

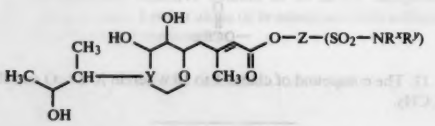
Filed Sep. 24, 1980, Ser. No. 190,461

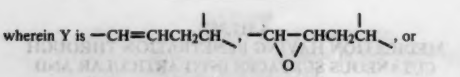
Claims priority, application United Kingdom, Sep. 28, 1979, 33720/79

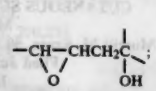
Int. Cl.³ A61K *27/00, 31/35;* **C07D** *309/06*

U.S. Cl. 424—248.5 **12 Claims**

1. A compound of the formula:



wherein Y is 



Z is a member selected from the group consisting of alkylene of 1 to 20 carbon atoms, cycloalkylene of 3 to 8 carbon atoms, alkenylene of 2 to 20 carbon atoms, arenylene, aralkylene or cycloalkylalkylene; and

each of R^x and R^y when taken independently of each other is (a) hydrogen, (b) an alkyl group of 1 to 20 carbon atoms or an alkenyl group of 2 to 8 carbon atoms, unsubstituted or substituted with cycloalkyl of 3 to 7 carbon atoms, halo, carboxy, alkoxycarbonyl, of 1 to 6 carbon atoms in the alkoxy group, carbamyl, aryl, hydroxy, alkanoyloxy of 1 to 6 carbon atoms, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 1 to 6 carbon atoms in each alkyl group; (c) cycloalkyl of 3 to 7 carbon atoms unsubstituted or substituted with alkyl of 1 to 6 carbon atoms; or (d) aryl; or

R^x and R^y together with the nitrogen atom to which they are attached are pyrrolidino, piperidino or morpholino.

10. A pharmaceutical composition comprising an antibacterially efective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier.

11. A veterinary premix comprising an amount of a compound according to claim 1 sufficient upon dilution at a predetermined ratio with feedstuff or with drinking water to provide upon normal consumption of said feedstuff or drinking water an antibacterially effective amount of said compound, and a veterinarily acceptable carrier.

4,312,868

ISOTHIOCHROMANS

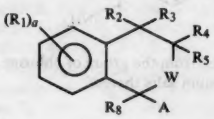
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 847,350, Oct. 31, 1977, abandoned. This application May 15, 1979, Ser. No. 39,487

Int. Cl.³ A61K *31/38;* **C07D** *335/06, 409/06*

U.S. Cl. 424—249 **6 Claims**

1. A compound having the formula



Ib

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

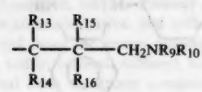
R_2 through R_5 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3 or R_4 and R_5 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_5 are hydrogen.

R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

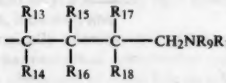
W is sulfur; and A is selected from the group consisting of: (i) $—(CH_2)_nNR_9R_{10}$, wherein n is one to five with t e

proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

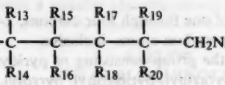
(ii) $-(CH_2)m-(OCH_2CH_2)q-NR_{21}R_{22}$, wherein m and q are each one to three, and R_{21} and R_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms, morpholine, and NR_9R_{10},



(iii)

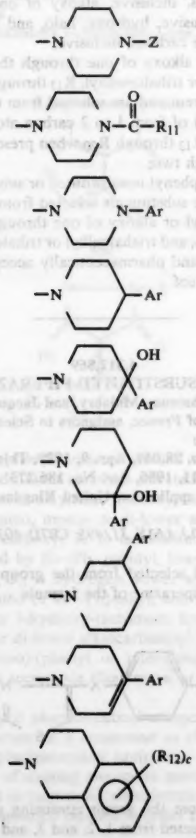


(iv)



(v)

wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of



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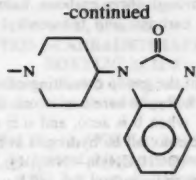


and

$-NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

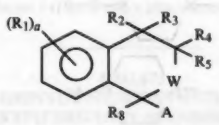
Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group, consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

5. A method of treating hypertension in mammals which comprises administering systemically to mammals an antihypertensive dose of compounds selected from the group consisting of compounds having the formula



Ib

wherein

R^1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_5 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when $R_2$and R_3 or R_4 and R_5 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_5 are hydrogen,

R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of

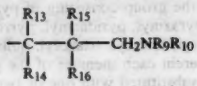
alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

W is sulfur; and

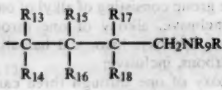
A is selected from the group consisting of:

(i) $-(CH_2)_nNR_9R_{10}$, wherein n is one to five with the proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

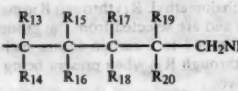
(ii) $-(CH_2)m-(OCH_2CH_2)q-NR_{21}R_{22}$, wherein m and q are each one to three, and R_{21} and R_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms, morpholine, and NR_9R_{10},



(iii)

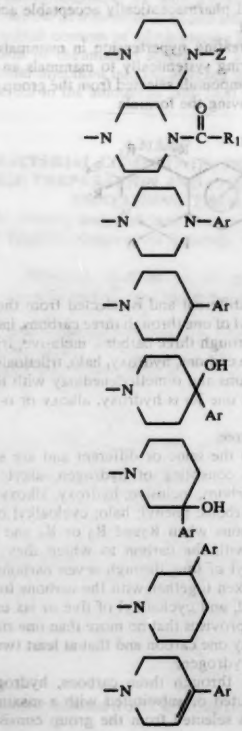


(iv)

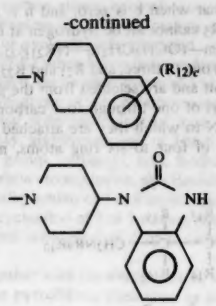


(v)

wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of



-continued



and

$-NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive, at least one of R_{13} through R_{20} when present being alkyl,

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group, consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and triahaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

4,312,869

MONOSUBSTITUTED PIPERAZINES

Gilbert Regnier, Chatenay Malabry, and Jacques Bure, Neuilly-sur-Seine, both of France, assignors to Science Union et Cie, Suresnes, France

Division of Ser. No. 28,049, Apr. 9, 1979. This application Sep. 11, 1980, Ser. No. 186,273

Claims priority, application United Kingdom, Apr. 13, 1978, 14565/78

Int. Cl.³ A61K *31/495*; C07D *403/04*

U.S. Cl. 424—250 **12 Claims**

1. A compound selected from the group consisting of a monosubstituted piperazine of the formula

(I)

in which:

A is selected from the group consisting of $-(CH_2)_n-$ in which n is selected from 1, 2, and 3, and

in which R is selected from the group consisting of alkyl having from 1 to 5 carbon atoms, inclusive, trifluoromethyl, unsubstituted phenyl and phenyl mono- and polysubstituted by a substituent selected from the group consisting of halogen, alkyl and alkoxy each having from 1 to 5 carbon atoms, inclusive, and trifluoromethyl, and

X is selected from the group consisting of a single bond, oxygen, sulfur, sulfinyl, sulfonyl, and carbonyl, and

Y is selected from the group consisting of hydrogen, halogen, and alkyl and alkoxy each having from 1 to 5 carbon atoms, inclusive, and

physiologically tolerable acid addition salts thereof.

10. A pharmaceutical composition containing as active ingredient a compound of claim **1** in an amount of 20 to 200 mg, together with a suitable pharmaceutical carrier.

4,312,870
PYRAZOLOQUINOLINES

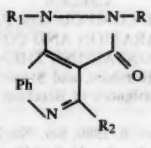
Naokata Yokoyama, Cliffside Park, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 50,716, Jun. 21, 1979, abandoned. This application May 16, 1980, Ser. No. 150,398

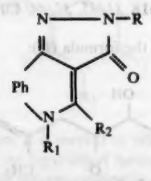
Int. Cl.[3] **A61K** *31/47;* **C07D** *471/04*

U.S. Cl. 424—258 **16 Claims**

1. A 2-aryl-pyrazolo[4,3-c]quinolin-3-one compound of the formulae



and



wherein Ph is 1,2-phenylene, unsubstituted or substituted by up to 3 identical or different members selected from lower alkyl, lower alkoxy, lower alkylthio, hydroxy, halogeno, trifluoromethyl, nitro, amino, mono- or di-lower alkylamino, cyano, carbamoyl and carboxy; R is unsubstituted or substituted phenyl as defined by H—Ph, pyridyl, lower alkylpyridyl or halogenopyridyl; R_1 is hydrogen, lower alkyl or lower (hydroxy, dialkylamino or H—Ph)-alkyl; and R_2 is hydrogen or lower alkyl; their 3-hydroxy-tautomers; lower alkanoyl, carbamoyl, mono- or di-lower alkylcarbamoyl derivatives of said (hydroxy or amino)-(phenyl or phenylene) compounds; or pharmaceutically acceptable alkali metal or acid addition salts thereof.

13. An anxiolytic pharmaceutical composition, comprising an anxiolytic amount of a compound as claimed in claim **1**, together with a pharmaceutical excipient.

14. A method of treating anxiety in mammals, which comprises the enteral or parenteral administration of an anxiolytic amount of a composition claimed in claim **13** to said mammals in need thereof.

4,312,871
6-, 1- AND 2-SUBSTITUTED-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

Burton G. Christensen, Scotch Plains, and David H. Shih, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 3, 1979, Ser. No. 99,275

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—263 **10 Claims**

1. A compound having the structure:

and the pharmaceutically acceptable salts thereof; wherein R^1, R^2, R^6, R^7 and R^8 are independently selected from the group consisting of hydrogen, (R^1 and R^2 are not hydrogen), substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; spirocycloalkyl having 3–6 carbon atoms; phenyl; aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the alkyl chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, iodo, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; when R^6/R^7 is hydrogen and R^7/R^6 is 1-hydroxyethyl, then R^8 is not 2-aminoethyl or an N-derivative thereof.

9. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to any one of claims 1–7 or 8 and a pharmaceutical carrier therefor.

4,312,872
1-ALKA-2,4-DIENYL-2-HYDROXYMETHYL-3,4,5-TRIHYDROXYPIPERIDINES AS INHIBITORS OF α-GLUCOSIDE HYDROLASES

Bodo Junge; Lutz Müller; Rüdiger Sitt; Günter Thomas; Hans P. Krause, and Walter Puls, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

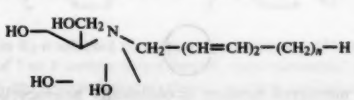
Filed Jun. 11, 1980, Ser. No. 158,541

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925943

Int. Cl.[3] **A61K** *31/445;* **C07D** *211/146*

U.S. Cl. 424—267 **10 Claims**

1. A 2-hydroxymethyl-3,4,5-trihydroxypiperidine derivative of the formula



in the form of individual stereoisomers or mixtures thereof, in which n is 0, 1, 2, 3, 4 or 5.

9. A method of combating adiposity, diabetes or lipoproteinaemia in warm-blooded animals which comprises administering to the animals an amount effective for treating adiposity, diabetes or lipoproteinaemia, of an active compound

according to claim 1 either alone or in admixture with a pharmaceutical diluent or in the form of a medicament.

4,312,873

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

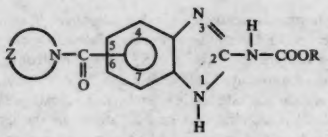
Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 946,985, Sep. 29, 1978, Pat. No. 4,191,764, which is a division of Ser. No. 758,112, Jan. 10, 1977, Pat. No. 4,139,626, which is a continuation-in-part of Ser. No. 668,778, Mar. 19, 1976, abandoned. This application Sep. 13, 1979, Ser. No. 74,835

Int. Cl.³ A61K *31/44;* **C07D** *403/06*

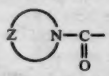
U.S. Cl. 424—263 **12 Claims**

1. A compound selected from the group of compounds represented by the formula:



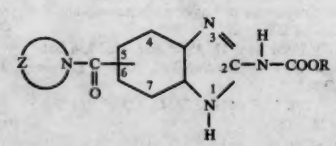
where R is a lower alkyl group having 1 to 4 carbon atoms;

is a 6 membered mono- or di-olefinically unsaturated heterocyclic ring containing only 1 nitrogen as the only, hetero atom; the



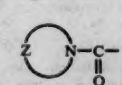
substitution being at the 5(6)-position; or a pharmaceutical acceptable salt thereof.

5. A composition for controlling helminths in mammals comprising a pharmaceutically acceptable non-toxic excipient and an anthelmintically effective amount of a compound selected from the group of compounds represented by the formula:



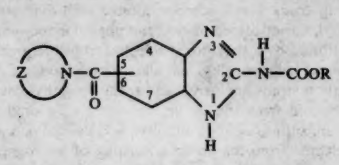
where R is a lower alkyl group of 1 to 4 carbon atoms;

is a 6 membered mono-or di-olefinically heterocyclic ring containing only one nitrogen as the only hetero atom; the



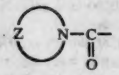
substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

10. A method for controlling helminths in mammals which comprises administering an anthelmintically effective amount of a compound selected from the group of compounds represented by the formula:



where R is lower group having 1 to 4 carbon atoms;

is a 6 membered mono- or di-olefinically unsaturated heterocyclic ring containing only one nitrogen atom as the only hetero atoms; the



substitution being at the 5(6)-position; or pharmaceutically acceptable salt thereof.

4,312,874

ANTIBACTERIAL COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Norman H. Rogers, Horsham, and Steven Coulton, Cranleigh, both of England, assignors to Beecham Group Limited, England

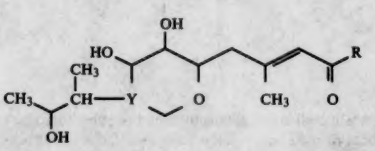
Filed Nov. 6, 1980, Ser. No. 204,605

Claims priority, application United Kingdom, Nov. 10, 1979, 39015/79

Int. Cl.³ A61K *31/35, 31/44;* **C07D** *309/06*

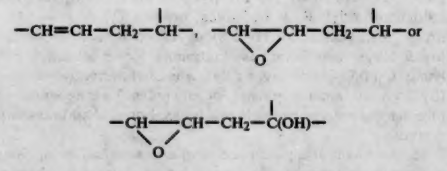
U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula (II):



(II)

wherein Y represents



and R represents a C_{1-10} alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, aryl, aralkyl or cycloalkylalkyl group, optionally substituted with halogen, C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, carboxy or C_{1-6}alkoxy carbonyl, or pyridyl.

5. A pharmaceutical or veterinary composition comprising

an antibacterially effective amount of a compound according to claim 1 together with a pharmaceutically or veterinary acceptable carrier or excipient.

4,312,875

5-(PYRIDINYL)-6-(LOWER-ALKYL)-2(1H)-PYRIDINONES, 1,2-DIHYDRO-2-OXO-5-(PYRIDINYL)-6-(LOWER-ALKYL)NICOTINIC ACIDS AND LOWER-ALKYL ESTERS THEREOF, AND CARDIOTONIC USE THEREOF

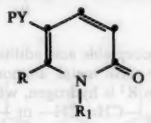
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 135,100, Mar. 28, 1980. This application Nov. 6, 1980, Ser. No. 204,726

Int. Cl.³ C07D *401/04;* A61K *31/44, 31/455*

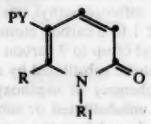
U.S. Cl. 424—266 18 Claims

1. A 1-R_1-5-PY-6-R-2(1H)-pyridinone having the formula



where R_1 is hydrogen, R is methyl or ethyl and PY if 4-, 3- or 2-pyridinyl or 4-, 3- or 2-pyridinyl having one or two lower-alkyl substitutents, or pharmaceutically-acceptable acid-addition or cationic salt thereof.

13. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such a patient a cardiotonically-effective amount of a 1-R_1-5-PY-6-R-2(1H)-pyridinone having the formula



where R_1 is hydrogen, R is methyl or ethyl and PY is 4-, 3- or 2-pyridinyl or 4-, 3- or 2-pyridinyl having one or two lower-alkyl substitutents, or pharmaceutically-acceptable acid-addition or cationic salt thereof.

4,312,876

ANTIDEPRESSIVE AND ANALGESIC 4-ARYLOXY- AND 4-ARYLTHIO-3-PHENYLPIPERIDINES

Solomon S. Klioze, Flemington, and Frederick J. Ehrgott, Bernardsville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

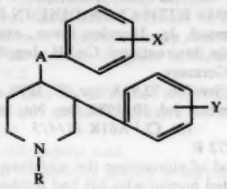
Continuation-in-part of Ser. No. 14,548, Feb. 23, 1979, Pat. No. 4,216,218. This application Feb. 19, 1980, Ser. No. 117,532

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ A61K *31/445;* C07D *211/46, 211/54*

U.S. Cl. 424—267 64 Claims

1. A compound of the formula



or a physiologically acceptable salt or stereoisomer thereof in which A is oxygen or sulfur; R is hydrogen, loweralkyl, lowercycloalkylloweralkyl, loweralkenyl, loweralkynyl, loweralkanoyl, lowercycloalkylloweralkanoyl, lowercycloalkylcarbonyl, cyanoloweralkyl, —$COOR_1$ or —R_2PhZ; R_1 is loweralkyl, loweralkenyl or —CH_2CCl_3; R_2 is loweralkylene, oxyloweralkylene, loweralkylenecarbonyl, carbonylloweralkylene or alkylene ethylene ketal; Ph is phenyl or phenylene; Z is hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy, nitro or amino; and X and Y are the same or different and each can be hydrogen, loweralkyl, loweralkoxy, halogen, nitro, amino, acetamido, trifluoromethyl, hydroxy, benzyloxy, loweralkanoyloxy, or cyano.

58. A method of treating depression in a patient which comprises administering to said patient an effective antidepressive amount of the compound defined in claim 1.

61. A method of alleviating pain in a patient which comprises administering to said patient an effective analgesic amount of the compound defined in claim 1.

4,312,877

1-(2-HYDROXY-3-N-ALKOXYPROPYL)-4-SUBSTITUTED PIPERIDINES, PHARMACEUTICAL COMPOSITIONS, THEREOF AND USE THEREOF

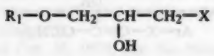
Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 55,936, Jul. 9, 1979, Pat. No. 4,255,426. This application Oct. 31, 1980, Ser. No. 202,501

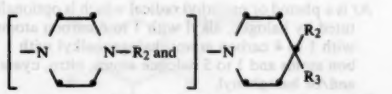
Int. Cl.³ A61K *31/445;* C07D *211/22*

U.S. Cl. 424—267 16 Claims

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is n-alkyl of 10 to 20 carbon atoms; and X is



wherein R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, benzyl, monosubstituted benzyl, phenyl and monosubstituted phenyl, wherein said substituents are selected from the group consisting of chloro, bromo, fluoro, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms; and R_3 is selected from the group consisting of hydrogen, methyl, —CH_2NH_2 and —$CONH_2$.

16. A method of immune regulation in a host which comprises administering to said host an effective immune regulant amount of a compound of claim 1.

4,312,878

METHOD OF ELIMINATING OPIATE WITHDRAWAL SYMPTOMS WITH CLONIDINE IN HUMANS

Donald E. Redmond, Jr., Hamden, Conn., assignor to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 33,943, Apr. 27, 1979, abandoned. This application Jul. 10, 1980, Ser. No. 168,258

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R 2 Claims

1. The method of eliminating the withdrawal symptoms in an opiate-addicted human who has had methadone treatment, which comprises orally administering to said human an effective amount of 2-(2,6-dichloroanilino)-2-imidazoline or a nontoxic, pharmaceutically acceptable acid addition salt thereof.

4,312,879

CLONIDINE AND LOFEXIDINE AS ANTIDIARRHEAL AGENTS

Harbans Lal, Kingston, R.I., assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Aug. 14, 1980, Ser. No. 178,232

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R 8 Claims

1. A method of alleviating the symptoms of diarrhea induced by a toxin, antigen, a general irritant or by the administration of an antibiotic, but excluding diarrhea induced by central nervious system disorders, in a patient not otherwise being treated with clonidine, lofexidine or an antihypertensive drug, comprising administering to such a patient an antidiarrheally-effective, non-antihypertensive amount of clonidine, lofexidine or a pharmaceutically acceptable salt thereof for a period of up to 4 days.

4,312,880

FUNGICIDAL IMIDAZOLYL-ENOL ETHERS

Wilfried Draber, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

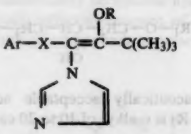
Filed Jul. 17, 1980, Ser. No. 170,276

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931665

Int. Cl.³ A01N *43/50*; C07D *233/56*; A01N *59/06, 59/20*

U.S. Cl. 424—273 R 7 Claims

1. An imidazolyl-enol ether of the formula



in which

Ar is a phenyl or naphthyl radical which is optionally substituted by halogen, alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 halogen atoms, nitro, cyano, phenyl and/or halophenyl,

R is an alkyl group with 1 to 4 carbon atoms, and

X is an oxygen atom or a methylene radical, or an addition product thereof with a physiologically acceptable acid selected from the group consisting of a hydrogen halide acid, phosphoric acid, nitric acid, sulphuric acid, a monofunctional or bifunctional carboxylic acid or hydroxycarboxylic acid, or a sulphonic acid, or with a metal salt in which the metal is copper, zinc, manganese, magnesium, tin, iron or nickel and the anion is derived from hydrochloric, hydrobromic, phosphoric, nitric or sulphuric acid.

6. A method of combating phytopathogenic fungi comprising applying to the fungi, or to a habitat thereof, a plant fungicidally effective amount of a compound or addition product thereof according to claim 1.

4,312,881

THIOHYDANTOINS HAVING PROSTAGLANDIN-LIKE ACTIVITIES

Gordon Wootton, Sawbridgeworth, England, assignor to Beecham Group Limited, England

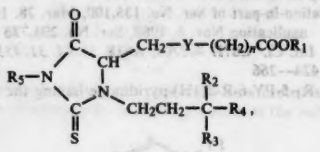
Division of Ser. No. 24,190, Mar. 27, 1979, Pat. No. 4,246,273. This application Sep. 11, 1980, Ser. No. 186,408

Claims priority, application United Kingdom, Mar. 30, 1978, 12367/78; Oct. 13, 1978, 40506/78

Int. Cl.³ A61K *31/415*; C07D *233/64*

U.S. Cl. 424—273 R 9 Claims

1. A compound of the formula:



a pharmaceutically acceptable acid addition salt thereof, or an alkali metal, alkaline earth metal, ammonium and substituted ammonium salt when R^1 is hydrogen, wherein

Y is $-CH_2CH_2-$, $-CH=CH-$ or $-C\equiv C-$

n has a value of 1 to 5;

R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, benzyl, tolyl, phthalidyl, pivaloyloxymethyl, 1-ethoxycarbonyloxyethyl or acetoxymethyl;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, trifluoromethyl or phenyl;

R_3 is hydroxy, alkanoyloxy of 1 to 4 carbon atoms or benzyloxy;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenylalkyl wherein alkyl has 1 to 6 carbon atoms, said phenyl and phenylalkyl being unsubstituted or substituted with one or more members selected from the group consisting of halo, trifluoromethyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, and nitro; and

R_4 is (a) alkoxyalkyl of up to 9 carbon atoms or (b) alkyl of up to 6 carbon atoms substituted by cycloalkoxy of 3 to 8 carbon atoms, phenoxy or napthoxy, said phenoxy and napthoxy being unsubstituted or substituted with one or more members selected from the group consisting of halo, trifluoromethyl, alkyl of 1 to 6 carbon atoms, hydroxy, alkoxy of 1 to 6 carbon atoms and nitro.

9. A method of effecting a prostaglandin-like response in humans and domestic animals, which comprises the administration thereto of an effective amount of a compound according to claim 1.

4,312,882

THIENYOXY AND FURYL CONTAINING ANALOGS OF PROSTACYCLIN AND THEIR USE AS MEDICAMENTS

Wilhelm Bartmann, Bad Soden am Taunus; Elmar Konz, Kelkheim; Ulrich Lerch, Hofheim am Taunus, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,684

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902809

Int. Cl.³ C07D *307/935, 303/32*; A61K *31/557*

U.S. Cl. 424—275 5 Claims

1. A compound selected from the group consisting of 16-(3-thienyloxy)-17,18,19,20-tetranor-prostacyclin methyl ester and 17-(2-furyl)-18,19,20-trinor-prostacyclin methyl ester.

4. A pharmaceutical composition for the treatment of hypertension, which composition comprises a therapeutically effective amount of a compound as in claim 1 and a pharmaceutical carrier therefor.

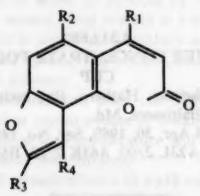
4,312,883

FUROCOUMARIN FOR THE PHOTOCHEMOTHERAPY OF PSORIASIS AND RELATED SKIN DISEASES

Francarosa Baccichetti; Franco Bordin; Francesco Carlassare; Francesco Dall'Acqua; Adriano Guiotto; Giovanni Pastorini; Giovanni Rodighiero; Paolo Rodighiero, and Daniela Vedaldi, all of Padua, Italy, assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Aug. 15, 1980, Ser. No. 178,292
Claims priority, application Italy, Aug. 20, 1979, 84134 A/79
Int. Cl.³ A61K *31/37*; C07D *493/04*
U.S. Cl. 424—279 11 Claims

1. A compound for the photochemotherapy of psoriasis and related skin diseases characterized by cellular hyperproliferation, said compound having the formula:

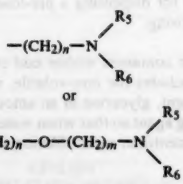


in which

R_1 and R_3, which may be the same or different, are hydrogen, methyl or ethyl;

R_2 is hydrogen, methyl or ethyl, and

R_4 is methoxymethyl, hydroxymethyl, acetoxymethyl or a group of the formula:



wherein R_5 and R_6 are independently hydrogen, methyl or ethyl and n and m are independently an integer of 1 to 3, or a pharmaceutical salt thereof.

4,312,884

TREATMENT OF HERPES SIMPLEX

Samuel Soichet, 1088 Park Ave., New York, N.Y. 10028

Filed Dec. 8, 1980, Ser. No. 213,830
Int. Cl.³ A61K *31/35*
U.S. Cl. 424—283 7 Claims

1. A method of treating herpes simplex which comprises the administration of an anti-herpetic effective amount of spectinomycin or a non-toxic salt thereof to an individual in need of such treatment.

4,312,885

CHLOROCITRIC ACIDS

Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, North Caldwell; Francis A. Mennona, Nutley, and Ann C. Sullivan, Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 26, 1978, Ser. No. 973,504
Int. Cl.³ A61K *31/19*; C07C *59/265*
U.S. Cl. 424—317 17 Claims

1. (−)-threo-chlorocitric acid.

2. The method for treating obesity in mammals which comprises administering to an obese mammal an anoretically-effective amount of (−)-threo-chlorocitric acid or a pharmaceutically-acceptable salt thereof.

6. An anorectic composition which comprises a carrier material and as an active ingredient an amount of (−)-threo-chlorocitric acid or a pharmaceutically-acceptable salt thereof which is effective as an anorectic.

10. A method for treating obesity in mammals which comprises administering to an obese mammal an anoretically-effective amount of (±)-threo-chlorocitric acid or a pharmaceutically-acceptable salt thereof.

14. An anorectic composition which comprises a carrier material and as an active ingredient an amount of (±)-threo-chlorocitric acid or a pharmaceutically-acceptable salt thereof which is effective as an anorectic.

4,312,886

PREVENTION OF GASTRIC ULCERS AND DEPRESSION OF GASTRIC SECRETION BY ADMINISTRATION OF GUANABENZ

Melvyn I. Gluckman, Ann Arbor, Mich., assignor to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 926,486, Jul. 20, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,837
Int. Cl.³ A61K *31/155*
U.S. Cl. 424—326 2 Claims

1. A method for preventing gastric ulcer formation in a warm-blooded animal which comprises administering to said animal in need thereof an effective amount of guanabenz, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

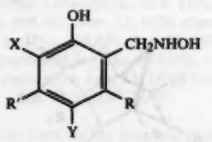
4,312,887

2-HYDROXYLAMINOMETHYL PHENOLS

Fortuna Haviv, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

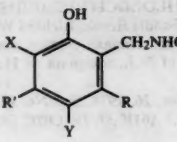
Filed Oct. 25, 1978, Ser. No. 954,699
Int. Cl.³ A01N *33/02*; C07C *83/00*
U.S. Cl. 424—330 24 Claims

1. A compound of the formula



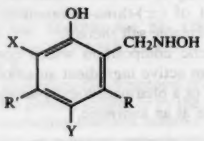
wherein X is hydrogen, halogen, loweralkyl, loweralkyloxy, loweralkylmercapto or trifluoromethyl; Y is chlorine, loweralkyl or loweralkyloxy; R and R′ are hydrogen, loweralkyl, loweralkyloxy or chlorine; and nontoxic acid addition salts thereof.

13. The method of increasing urine excretion in a warm-blooded animal consisting essentially in administering to said animal a diuretically sufficient amount of a compound of the formula



wherein X is hydrogen, halogen, loweralkyl, loweralkyloxy, loweralkylmercapto or trifluoromethyl; Y is chlorine, loweralkyl or loweralkyloxy; R and R′ are hydrogen, loweralkyl, loweralkyloxy or chlorine; and nontoxic acid addition salts thereof.

19. The method of reducing edema or inflammation in a warm-blooded animal consisting essentially in administering to said animal an anti-inflammatory amount of a compound of the formula



wherein X is hydrogen, halogen, loweralkyl, loweralkyloxy, loweralkylmercapto or trifluoromethyl; Y is chlorine, loweralkyl or loweralkyloxy; R and R′ are hydrogen, loweralkyl, loweralkyloxy or chlorine; and nontoxic acid addition salts thereof.

4,312,888

FLAVORING WITH CARBOALKOXY ALKYL NORBORNANES

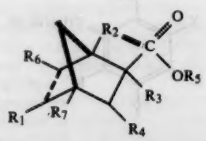
Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 133,870, Mar. 25, 1980. This application Nov. 13, 1980, Ser. No. 206,466

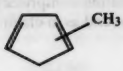
Int. Cl.³ A23L *1/226*

U.S. Cl. 426—3 **8 Claims**

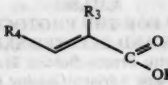
1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of adding to a foodstuff base or chewing gum base from 0.01 parts per million up to about 100 parts per million based on total composition of a composition of matter containing a major proportion of at least one compound defined according to the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; wherein each of R_1, R_2, R_3, R_4, R_6 and R_7 represents hydrogen or methyl with the proviso that one of R_1, R_2, R_6 and R_7 is methyl and each of the other of R_1, R_2, R_6 and R_7 is hydrogen; and with the further proviso that R_3 and R_4 are not both methyl; and wherein R_5 is C_1–C_4 alkyl produced by the process of reacting at least one methyl cyclopentadiene defined according to the structure:



with an alkyl acrylate derivative defined according to the structure:



in the presence of a Lewis acid catalyst at a temperature in the range of 0°–50° C. or in the absence of a catalyst at a temperature in the range of 170°–250° C., said Lewis acid catalyst being an alkyl aluminum dihalide or a dialkyl aluminum halide having the formula: $R_m' AlCl_n$ wherein R′ is C_1–C_3 alkyl and the sum, m+n, equals 3; with m being one or two and n being one to two.

4,312,889

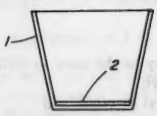
LIQUID CARRIER CONCENTRATE FOR PRE-LOADED CUP

Stephen T. Melsheimer, Hatboro, Pa., assignor to Design & Funding, Inc., Baltimore, Md.

Filed Apr. 30, 1980, Ser. No. 145,375

Int. Cl.³ A23L *2/00;* **A61K** *7/22;* **B65B** *29/06*

U.S. Cl. 426—86 **6 Claims**



1. An article for dispensing a pre-loaded concentrate upon dilution, comprising:

a cup; and

a concentrate contained within said cup wherein said concentrate includes the non-volatile, water miscible, liquid wetting agent, glycerine in an amount sufficient to serve as a wetting agent so that when water is added as a diluent to the concentrate, rapid dilution of the concentrate results.

4,312,890

PREPARATION OF A COCOA SUBSTITUTE FROM YEAST

James J. Liggett, Twin Falls, Id., assignor to Coors Food Products Company, Golden, Colo.

Continuation-in-part of Ser. No. 964,802, Dec. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 863,079, Dec. 22, 1977, abandoned. This application May 15, 1980, Ser. No. 149,992

Int. Cl.³ A23G *1/00;* **C12C** *11/28*

U.S. Cl. 426—466 **23 Claims**

1. A method of producing a cocoa substitute exhibiting the color, flavor and aroma characteristics of natural cocoa comprising roasting dry yeast under conditions producing yeast temperatures of about 175° C. to about 225° C. for between one to three hours.

4,312,891

SHELF STABLE DESSERT PRODUCT AND METHOD FOR MANUFACTURE THEREOF

Herbert R. Eisfeldt, Schiller Park, Ill., assignor to Kraft, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 939,247, Sep. 5, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,114

Int. Cl.[3] A23C *19/09*; A23L *1/04*

U.S. Cl. 426—573 15 Claims

1. A method for manufacture of a shelf stable dessert product which has a reversible gel structure at refrigeration temperatures comprising the steps of

providing a homogeneous, aqueous dessert mixture of gelatin, starch, a sweetening agent, and a proteinaceous source selected from the group consisting of cream cheese, neufchatel cheese, cottage cheese, casein, an edible caseinate salt and an edible soy proteinate salt,

adjusting the fat content of said mixture to provide said mixture with a fat content in the range of from about 15 to about 25 percent by weight, based on the weight of said mixture, said gelatin being present in said dessert mixture at a level of from about 0.4 to about 0.7 by weight, said starch being present in said dessert mixture at a level of from about 0.4 to about 2 percent by weight, said sweetening agent being present in said dessert mixture at a level of from about 10 to about 25 percent by weight, and said proteinaceous source being present at a level to provide a protein content in said dessert mixture at a level of from about 2 to about 7 percent by weight, based on the weight of said dessert mixture,

homogenizing said mixture after the addition of any fat source other than cream cheese or cream,

heating said mixture to a temperature and for a time sufficient to pasteurize said mixture,

adjusting the pH of said mixture to a pH value below about 4.6, and

cooling said mixture to ambient temperature to provide a substantially syneresis-free, ambient temperature shelf stable thixotropic dessert product having a reversible gel structure at refrigeration temperature such that said dessert product is pourable at ambient temperature and is gelled at refrigeration temperature.

4,312,892

MAKING CORN PRODUCTS

Manuel J. Rubio, 192 Benham Ave., Bridgeport, Conn. 06605

Division of Ser. No. 22,787, Mar. 22, 1979, Pat. No. 4,250,802. This application May 27, 1980, Ser. No. 153,539

Int. Cl.[3] A23L *1/00*

U.S. Cl. 426—626 6 Claims

1. A method of forming foodstuff materials from corn comprising the steps of

heating corn with the hull thereon and while in the unwetted state to a hull temperature of 135° C.–150° C. so as to cause cracking of the corn hulls,

quenching said heated corn with lime water to adjust the moisture content of the grain to a range of about 18% to about 27%.

grinding said corn into particles,

segregating out particles according to desired size,

combining selected particles with a sufficient amount of lime water to form dough therefrom, and

heating said dough so as to cook same.

4,312,893

COATING OF TABLETS

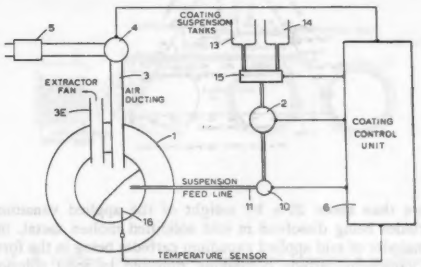
Bernard V. Futter, Liverpool, England, assignor to Evans Medical Limited, Liverpool, England

Division of Ser. No. 595,128, Jul. 11, 1975, Pat. No. 4,168,674. This application Jun. 4, 1979, Ser. No. 44,937

Claims priority, application United Kingdom, Jul. 16, 1974, 31414/74

Int. Cl.[3] A23G *3/26*

U.S. Cl. 427—3 1 Claim



1. In a method of coating tablets comprising the steps of tumbling a batch of tablets in a rotating coating pan and subjecting the tablets while they are in the pan to a plurality of treatment steps each of which consists of a plurality of treatment cycles each including a dosing period in which a measured quantity of tablet coating liquid is introduced into the pan, a drying period in which drying air is supplied to the interior of the pan and an intermediate mixing period during which the tablets tumble in contact with the already introduced coating liquid for a predetermined time and no drying air is supplied to the pan, and sensing the temperature of the batch of tablets being coated in the coating pan during the drying period, the improvement comprising preselecting a time interval that ends during the drying period and storing in a memory device as a reference temperature the temperature of the batch of tablets at the end of the preselected time interval from the commencement of the drying period, continuing the sensing of the temperature of the batch of tablets in the pan and producing a signal whenever during a drying period there is a preselected difference between the sensed temperature of tablets in the pan and the reference temperature stored in the memory devices, and utilizing such signal to terminate the drying period of such cycle and to initiate the dosing period of the next cycle.

4,312,894

HARD FACING OF METAL SUBSTRATES

Harry J. Brown, Lewiston, N.Y.; William D. Forgeng, Las Vegas, Nev., and Charles M. Brown, Lewiston, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

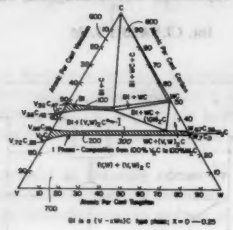
Division of Ser. No. 885,943, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 698,848, Jun. 23, 1976, abandoned, which is a continuation of Ser. No. 472,048, May 21, 1974, abandoned. This application Jun. 13, 1980, Ser. No. 159,447

Int. Cl.[3] C22C *29/00*

U.S. Cl. 427—34 5 Claims

1. In a method for hard facing iron and steel substrates by heating a surface of said substrate to its melting point, providing molten iron or steel thereon, applying particulate hard facing material to said molten iron or steel and forming a metallurgical bond between said metal surface and the applied hard-facing material upon solidification of the molten iron or steel, the improvement which comprises employing as the applied hard facing material a prealloyed finely divided particulate composition of chemically combined vanadium and carbon having tungsten in solid solution, said composition consisting essentially of (i) at least one vanadium carbide and (ii)

tungsten in solid solution with each vanadium carbide in said composition in an amount from about 10% by weight up to an amount equal to the solid solubility limit of tungsten in each vanadium carbide in said composition, the aggregate amount of all vanadium carbides in said composition being at least about 10% by weight of said composition and about 5% to not



more than about 20% by weight of the applied vanadium carbides being dissolved in said solidified molten metal, the remainder of said applied vanadium carbides being in the form of vanadium carbide containing tungsten in solid solution metallurgically bonded to said metal substrate and substantially uniformly distributed in said molten metal.

4,312,895

METHOD FOR PREPARING WATER-SOLUBLE LACQUER

Hitoshi Yamazaki; Hiroshi Ito; Toshiyuki Takeda, all of Kamakura, and Junzo Enomoto, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 85,314, Oct. 16, 1979, Pat. No. 4,272,421. This application Feb. 2, 1981, Ser. No. 230,881

Int. Cl.³ B05D *7/22*; C08L *71/02*

U.S. Cl. 427—67 **2 Claims**

1. In the method for the formation of a glass envelope having a phosphor layer on the inside surface thereof which comprises coating the inside surface of a glass envelope with a liquid phosphor suspension, drying said coating and heating the coated envelope, the improvement according to which the liquid phosphor suspension is formed by dissolving polyethylene oxide having a molecular weight of at least 2,500,000 in water to form a polyethylene oxide aqueous solution, adding acid to said solution in such a manner as to adjust the pH of the solution in the range of from 3.0 to 5.0, heating the resultant solution at a temperature of not lower than 95° C., cooling the solution and removing the remaining acid with an ion exchange resin and admixing phosphor powder with the solution resulting from removing the acid.

4,312,896

NOVEL SOLDERING PROCESS COMPRISING COATING A DIELECTRIC SUBSTRATE WITH ELECTROCONDUCTIVE METAL PROTECTED BY NICKEL CARBIDE

Harris W. Armstrong, Ft. Worth, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Division of Ser. No. 931,861, Aug. 7, 1978, which is a continuation-in-part of Ser. No. 697,940, Jun. 21, 1976, abandoned. This application Mar. 3, 1980, Ser. No. 126,396

Int. Cl.³ H05K *3/12*

U.S. Cl. 427—96 **15 Claims**

1. In a process for making an electro-conductive connection between a conductive pattern on a dielectric substrate and another conductor, the improvement comprising the steps of

(a) providing said dielectric substrate with a coating of electroconductive metal pattern, said metal bearing an electroconductive, oxidation-protective layer of nickel carbide barrier material;

(b) decomposing said nickel carbide to provide new nickel surface area, and

(c) soldering said conductive pattern to said other conductor.

4,312,897

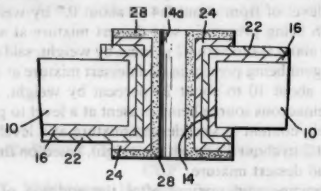
BURIED RESIST TECHNIQUE FOR THE FABRICATION OF PRINTED WIRING

William G. Reimann, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 943,093, Sep. 18, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,595

Int. Cl.³ H05K *3/42, 3/18*

U.S. Cl. 427—96 **10 Claims**



1. A method for producing printed circuitry having built-up areas and thin conductors comprising the steps of:

placing a mask of a first conductive material in a pattern defining the circuitry and the thin conductors on a conductive coating covering a dielectric substrate;

placing further conductive material different from the first conductive material over the conductive coating and the first conductive material;

placing a mask of a resist material on the further conductive material in a pattern defining the positions of the built-up areas; and

removing portions of the conductive coating and the further conductive material not covered respectively by the masks of the first conductive and the resist materials.

4,312,898

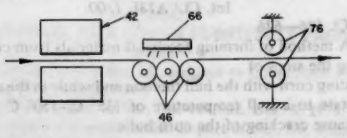
PROCESS FOR MAKING MAGNETIC TAPE

Gordon L. McDaniel, Graham, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Division of Ser. No. 908,644, May 23, 1978, Pat. No. 4,242,954. This application Sep. 12, 1980, Ser. No. 186,517

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—130 **3 Claims**



1. In a process for continuously making, on a web-processing line, a web of magnetic recording media of the type wherein a magnetic powder is dispersed in a coating of resin binder to form said magnetic recording media and carried on a sheet of organic resin film through a calender apparatus comprising a compliant roll and a second roll, the improvement comprising the steps of

1. calendering said web of magnetic recording media against a compliant calender roll surface formed of a sleeve of a shape-memory alloy, to achieve a smoothing and compression thereof, until said roll becomes damaged.
2. thereupon heating said sleeve to a transformation temperature to remove said damage while maintaining said roll in place on said processing line; and then
3. cooling said roll; and
4. resuming calendering of said magnetic recording member.

4,312,899

PROCESS FOR THE PRODUCTION OF OXIDATION-RESISTANT SINTERED SILICON NITRIDE BODIES WITH IMPROVED MECHANICAL STRENGTH

Claus-Peter Lahmann, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,257

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940629

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—180 **10 Claims**

1. A process for the production of oxidation-resistant sintered silicon nitride bodies having improved mechanical strength, characterized in that a material consisting essentially of aluminum oxide, alumininum nitride, or mixtures thereof is dissolved by diffusion in the surface of the sintered silicon nitride bodies at temperatures of not more than 1900° C.

4,312,900

METHOD OF TREATING SLIDING METAL CONTACT SURFACES

Leslie G. Simpson, Romford, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 9, 1980, Ser. No. 157,618

Int. Cl.³ B05D *7/22*

U.S. Cl. 427—181 **2 Claims**

1. A method of treating a metal contact surface for sliding engagement with another surface which comprises:
   (a) pitting said surface by shot blasting;
   (b) impregnating the pitted surface with a dry lubricant consisting of MoS_2; and
   (c) roughening the impregnated surface by shot blasting with glass shot having an average particle size of 250–400 microns in a manner to move some of the metal of the contact surface to form peaks for overhanging and partially closing at least some of said pits.

4,312,901

OIL BASED SIDE RELEASE AGENTS FOR COAL CARS

George T. Kekish, Chicago, and Roger W. Kugel, Warrenville, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 28, 1980, Ser. No. 144,119

Int. Cl.³ B05D *1/02, 7/22, 5/08*; B60S *5/00*

U.S. Cl. 427—236 **4 Claims**

1. A method for reducing the tendency of coal to freeze and thus adhere to the sides of metal storage and shipping containers used to store and/or transport said coal at temperatures below the freezing point of water which comprises spraying on the sides of the interior container a coating composition comprising:
   a. 55–97% by weight of a fuel oil;
   b. 3–45% by weight of a hydrocarbon oil-soluble surfactant having an HLB value of 1–8.

4,312,902

COATING COMPOSITION CAPABLE OF FORMING A MULTILAYER FILM

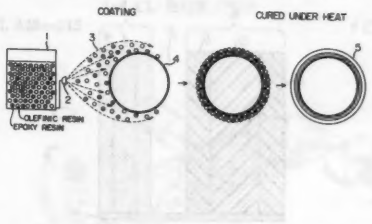
Heihachi Murase, and Tutomu Yamamoto, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Feb. 27, 1980, Ser. No. 125,234

Claims priority, application Japan, Mar. 7, 1979, 54-25637

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—386 **16 Claims**



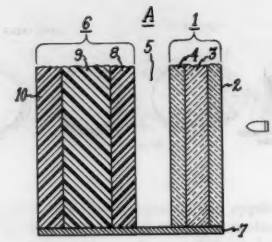
1. A coating composition capable of forming a multilayer coated film, said composition consisting essentially of:
   (a) a solid power comprising an olefinic resin containing at least 76% by weight of a structural unit derived from an olefin and having a melt index of from 0.3 to 120 g/10 min.,
   (b) a film-forming resin material containing an epoxy resin having a number average molecular weight of about 300 to about 4,000 and an epoxy equivalent of from 100 to 3,300, and
   (c) a volatile organic liquid medium capable of wetting said powder (a) but substantially incapable of swelling and dissolving said solid powder (a),
   wherein the weight ratio of said solid powder (a) to said film-forming resin mateial (b) is from 15:85 to 85:15,
   wherein the amount of said liquid medium (c) is 80 to 300 parts by weight per 100 parts by weight of said solid powder (a) and said film-forming resin material (b) combined, and
   said liquid medium being either
      (1) a liquid medium at least 70% by weight of which consists of a C_{5-16} aliphatic hydrocarbon, a C_{6-12} alicyclic hydrocarbon or both;
      (2) a mixed liquid medium consisting of at least one liquid medium having low polarity or no polarity selected from C_{5-16} aliphatic hydrocarbons, C_{6-12} alicyclic hydrocarbons, C_{6-15} aromatic hydrocarbons, and mixtures of these and at least one highly polar liquid medium selected from esters, ketones, ethers and halogenated hydrocarbons, said mixed liquid medium satisfying the following conditions (i) and (ii):
         (i) the agglomeration of the particles of the solid powder (a) should not be detectable when observing, with an optical microscope, a coated film which is obtained by dispersing 5 g of the solid powder (a) in 50 g of the liquid medium (c), allowing the dispersion to stand at room temperature for 7 days, and coating the dispersion on a glass plate by a 200 μm applicator;
         (ii) the undissolved epoxy resin should not be detectable when observing, with an optical microscope, a coated film which is obtained by dissolving 10 g of the epoxy resin in 50 g of the liquid medium (c), allowing the solution to stand at room temperature for 7 days, and coating the solution on a glass plate by a 200 μm applicator; or
      (3) cellosolve acetate, cyclohexanone, or both,
   said composition further containing curing agent for component (b).

4,312,903

IMPACT RESISTANT DOUBLE GLAZED STRUCTURE

Richard E. Molari, Jr., Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 5, 1980, Ser. No. 127,807
Int. Cl.[3] E06B *3/24;* B32B *9/04, 27/36*
U.S. Cl. 428—34 29 Claims



1. An impact resistant double glazed structure consisting essentially of, in combination, (i) a back laminate positioned opposite the direction of impact, said back laminate comprising a plurality of laminae selected from the group consisting of polycarbonate, glass and solid resinous materials, provided that at least one of said laminae is a polycarbonate lamina, said laminae being bonded together by a compatible adhesive; and (ii) a front glass laminate positioned forward of said back laminate respective to the direction of impact and spaced apart from said back laminate, said front laminate containing a plurality of glass laminae including a front glass lamina having a controlled thickness of from about 30 to about 220 mils facing and nearest to the direction of impact, a back glass lamina having a controlled thickness of from about 30 to about 220 mils opposite the direction of impact, and an intermediate glass core having a thickness greater than either said front glass lamina or said back glass lamina positioned between said front and back glass laminae, said front and back glass laminae being in surface to surface contact with said intermediate glass core and being bonded to said intermediate glass core by a compatible adhesive.

15. An impact resistant double glazed structure consisting essentially of, in combination, (i) a back laminate positioned opposite the direction of impact, said back laminate containing a plurality of laminae selected from the group consisting of polycarbonate, glass and solid resinous materials, provided that at least one of said laminae is a polycarbonate lamina, said laminae being bonded together by a compatible adhesive; and (ii) a front glass laminate positioned forward of said back laminate respective to the direction of impact and consisting essentially of a front glass lamina having a controlled thickness of from about 30 to about 220 mils facing and nearest to the direction of impact, a back glass lamina having a controlled thickness of from about 30 to about 220 mils opposite the direction of impact, and an intermediate glass core having a thickness greater than either said front glass lamina or said back glass lamina positioned between said front and said back glass laminae, said front and back glass laminae being in surface to surface contact with said intermediate glass core and being bonded thereto by a compatible adhesive, the surface of said back laminate facing and nearest to the direction of impact being adjacent to and in unbounded surface to surface contact with the surface opposite the direction of impact of the back glass lamina of said front glass laminate.

4,312,904

FAST-HARDENING HYDRAULIC CEMENT MASS AND SURFACING METHOD USING THE MASS

Adolf Meyer, Leimen/Lingental, Fed. Rep. of Germany, assignor to Heidelberger Zement AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 9, 1980, Ser. No. 138,609
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914410
Int. Cl.[3] F16L *9/02, 9/08;* B32B *13/02*
U.S. Cl. 428—36 15 Claims

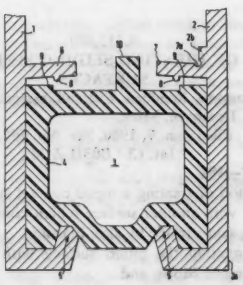
1. A rigid tube coated with a hydraulically set concrete mixture having a small tendency to cracking in the set condition, the concrete mixture comprising essentially a rapid hardening cement selected from the group consisting of modified Portland cement containing a $11CaO.7Al_2O_3.CaF_2$ phase and a Portland cement containing a hardening accelerator, water, alkali-resistant glass fibers, aggregates and additives.

4,312,905

HEAT-DAMMING COMPOUND PROFILE

Ulrich Kreusel, Schlosstrasse 14, 6531 Gensingen, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,904
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911832
Int. Cl.[3] B32B *3/02, 3/06, 3/08*
U.S. Cl. 428—122 12 Claims



1. Heat-damming compound profile, particularly for window or door frames or similar structural parts, comprising: metal profiled bars; an intermediate layer connecting said profiled bars and comprising a profiled shape-retaining insulating strip; each profiled bar having a forcible guide for said insulating strip; said profiled bars being provided outside the insulating bar to opposite located lugs, said lugs being pressable against said insulating strip.

8. Compound profile as defined in claim 1, wherein outside said insulating strip a hollow space is provided.

4,312,906

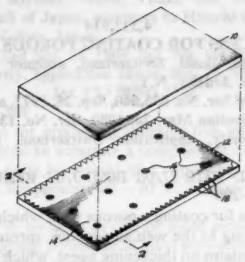
STOP-OFF COMPOSITION FOR METALS

Charles R. Arnold, and Donald A. Pennington, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 854,452, Nov. 23, 1977, Pat. No. 4,230,614.
This application Jun. 16, 1980, Ser. No. 160,000
Int. Cl.[3] B23K *35/36;* B32B *3/18, 5/16, 15/08*
U.S. Cl. 428—204 4 Claims

1. An article of manufacture comprising: a layered metal

structure, a coating arranged in patterns between contiguous layers of the metal with said coating comprising a powdered



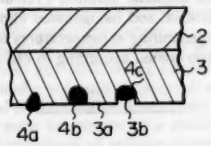
boron nitride dispersed in a viscous liquid of polyisobutylene dissolved in xylene and toluene.

4,312,907

WATER-IMPERMEABLE SHEET MATERIAL

Yoshiji Hiraoka, Musashino, and Tsutomu Obayashi, Tokyo, both of Japan, assignors to Hiraoka & Co. Ltd., Tokyo, Japan

Filed Mar. 14, 1980, Ser. No. 130,523
Claims priority, application Japan, Jul. 20, 1979, 54-92242; Jul. 28, 1979, 54-96417; Aug. 31, 1979, 54-111978
Int. Cl.³ B32B *23/00*
U.S. Cl. 428—212 20 Claims



1. A water-impermeable sheet material having one or two water-impermeable layers, at least one of which layers holds, on the surface thereof, a water drop-preventing agent in the form of fine solid particles and consisting of at least one hydrophilic but water-insoluble substance, at least a portion of said water drop-preventing agent being exposed to the ambient atmosphere.

4,312,908

COMPOSITE STRUCTURES, NEW ADHESIVE, AND CEMENT COMPOSITION

F. Bon Jasperson, 4121 NE. 26 Ave., Ft. Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 961,201, Nov. 16, 1978, Pat. No. 4,256,804, which is a division of Ser. No. 854,204, Nov. 23, 1977, Pat. No. 4,146,672, which is a continuation of Ser. No. 747,801, Dec. 6, 1976, abandoned. This application Oct. 4, 1979, Ser. No. 81,862
Int. Cl.³ B32B *3/26, 7/02, 31/06*
U.S. Cl. 428—214 7 Claims

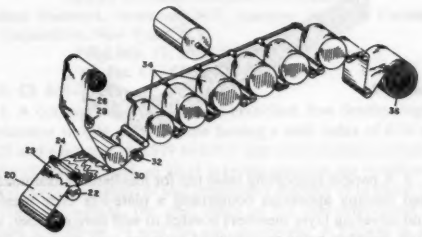
1. An insulating structural panel comprising a first facing at least 1/16 inch thick, a second facing at least 1/16 inch thick, a layer of rigid insulation at least one inch thick, sandwiched between said first facing and said second facing, said facings adhered to said insulation, at least one of said facings adhered to said insulation by an adhesive which is the dried residue of a latex polymer-rich coating composition, said residue being not less than 2–4 mils thick and containing at least 80% by weight of a film-forming polymer selected from the group consisting of acrylic polymers and vinyl polymers and having a Mar Elasticity Value of at least 1, and a wet and dry adhesion to maintain adhesion to said facing under normal atmospheric conditions.

4,312,909

INSULATING MATERIAL OF METAL FILM BONDED TO NON-WOVEN GLASS FABRIC WITH ETHYLENE/VINYL ACETATE COPOLYMER ADHESIVE

Julius Shaw, 79 Brook St., New Bedford, Mass. 02746

Division of Ser. No. 32,286, Apr. 23, 1979, Pat. No. 4,242,165. This application Aug. 18, 1980, Ser. No. 178,794
Int. Cl.³ B32B *17/10*
U.S. Cl. 428—215 1 Claim



1. A laminate for use in insulation of electrical apparatuses comprising:

a metal foil sheet such as aluminum foil, having a thickness of between 0.0007 in. and 0.001 in.;

a non-woven glass fiber paper-like sheet having a thickness of between 0.015 in. and 0.070 in.; and

a plasticized ethylene vinyl acetate co-polymer emulsion-type adhesive bonding said metal foil sheet to said non-woven glass fiber paper-like sheet.

4,312,910

STYRENE-ACRYLIC ACID COPOLYMER FOAM

Kyung W. Suh, Granville, Ohio, and Jonathan R. Jones, Mystic, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1980, Ser. No. 137,230
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—220 6 Claims

1. A synthetic resinous thermoplastic extruded foam having a direction of extrusion and an axis of extrusion, the foam having a plurality of generally closed cells containing gas, the foam having a cross sectional configuration taken in a plane normal to the axis of extrusion of at least 8 square inches and a minimum dimension of at least 0.7 inch, the foam comprising a copolymer of from about 99.5 parts by weight of styrene to about 70 parts by weight styrene copolymerized therein from about 0.5 to about 30 parts by weight of acrylic acid, the molecular weight of the styrene-acrylic acid copolymer is from about 100,000 to about 350,000 gram moles.

4,312,911

CHROMIUM OXIDE COATED REFRACTORY FIBERS

Russell D. Smith, Grand Island, N.Y., and Richard E. Tressler, Julian, Pa., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 41,033, May 21, 1979. This application Dec. 19, 1979, Ser. No. 105,320
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—224 5 Claims

1. A shrink resistant ceramic fiber article comprising ceramic fibers consisting essentially of from about 45 to 65 weight percent aluminum oxide and from about 35 to 55

weight percent silica said fibers being uniformly coated with from about 0.01 to about 5 weight percent of Cr_2O_3.

4,312,912

PATIENT SUPPORTING TABLE TOP IN MEDICAL EXAMINATION AND THERAPY APPARATUS

Hisaaki Tamura, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 31, 1980, Ser. No. 135,660
Claims priority, application Japan, Apr. 2, 1979, 54-41998
Int. Cl.³ B32B 5/16, 9/00, 9/04, 31/04
U.S. Cl. 428—244 5 Claims

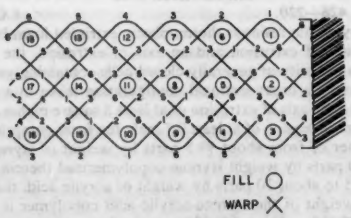
1. A patient supporting table top for mechanical examination and therapy apparatus comprising a plate-like core member and covering layer members bonded to said core member, said core member being sandwiched between said covering layer members; the improvement wherein said core member includes a great number of independent hollow carbon microspheres as the principal material thereof, said microspheres being mixed with a thermosetting resin to form said core member, each said covering layer member including a carbon film network having a resin material mixed therewith to form carbon fibre reinforced plastic members.

4,312,913

HEAT CONDUCTIVE FABRIC

Walter A. Rheaume, Fullerton, Calif., assignor to Textile Products Incorporated, Anaheim, Calif.

Filed May 12, 1980, Ser. No. 149,003
Int. Cl.³ B32B 7/00; D03D 13/00; B32B 5/12
U.S. Cl. 428—257 15 Claims



1. A multilayer fabric having improved heat conducting properties as follows:

a. a plurality of fill yarn layers;

b. an angle weave warp yarn interlocking the fill yarn layers to form a fabric structure, the angle weave traversing through the fabric structure thereby forming an outer conductive weave layer on each side of the fabric, the angle weave being selected from the class consisting of metallic fibers and fibers being totally coated with a heat conductive material thereon;

c. the metallized fibers of the angle weave warp yarn imparting improved heating conducting properties to the fabric by absorption of heat along one side of the fabric, transmission of the heat through the fabric along the interlocking warp yarn, and radiation from the opposite side of the fabric.

4,312,914

PROCESS FOR COATING POROUS WEBS

Christian Guth, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 836,640, Sep. 26, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,159
Claims priority, application Switzerland, Oct. 6, 1976, 12639/76
Int. Cl.³ B32B 27/00; B05D 3/02; B32B 23/08
U.S. Cl. 428—290 13 Claims

1. A process for coating a porous web, which comprises the steps of applying to the web an aqueous, spreadable composition which contains no thickening agent, which has a pH value of 3 to 6 and which includes 15 to 30% by weight of (A) an emulsion copolymer comprising (a) 50 to 95 percent by weight of an alkyl acrylate having 3 to 8 carbon atoms in the alkyl radical, (b) 1 to 40 percent by weight of acrylonitrile, (c) 2 to 6 percent by weight of an ethylenically unsaturated aliphatic carboxylic acid having 3 or 4 carbon atoms and/or the unsubstituted or methylated N-methylolamide thereof and (d) 0 to 20 percent by weight of another copolymerisable unsaturated compound which is free from acid groups, and 40 to 70% by weight of (B) an oragnic solvent which is substantially insoluble to at most slightly soluble in water, which has a boiling point between 50° and 160° C. and a molecular weight of 50 to 160, and which is selected from the group consisting of alkyl alkanecarboxylates, aliphatic ketones, cycloaliphatic ketones, aliphatic hydrocarbons, and halogenated aliphatic hydrocarbons, drying and then curing at temperatures of 100° to 200° C.

11. A porous web coated according to claim 1.

4,312,915

CERMET FILM SELECTIVE BLACK ABSORBER

John C. C. Fan, Chestnut Hill, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 873,434, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 624,701, Apr. 7, 1976, abandoned. This application Nov. 15, 1979, Ser. No. 94,370
Int. Cl.³ B32B 5/16, 15/04; F24J 3/02
U.S. Cl. 428—323 24 Claims

1. A selective black absorber capable of highly absorbing solar energy and only slightly emitting infrared energy comprising:

a composite substrate comprising a plastic layer and a low infrared emissivity film coating deposited thereon and said composite substrate being electrically nonconductive in the direction normal to the layer of said composite substrate,

a cermet film deposited on the film coating of said composite substrate, said cermet film comprising metal particles having diameters much less than the average wavelength of solar energy to be absorbed to cause the particles to behave as Lorentz oscillators in the visible light spectrum and thus be good solar energy absorbers,

said cermet film having a thickness and composition such that it has high solar absorptance and low infrared thermal emissivity as a coating on said substrate having low infrared emissivity.

4,312,916

PROCESS FOR PRODUCING ADHESIVE FILM

Hajime Kakumaru; Nobuyuki Hayashi; Toshiaki Ishimaru, all of Hitachi; Kiyoshi Nakao, Yuuki, and Tomohisa Ohta, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,240
Claims priority, application Japan, Sep. 11, 1979, 54-11694
Int. Cl.³ B05D *3/06*
U.S. Cl. 428—345 7 Claims

1. A process for producing adhesive film which comprises coating on a filmlike substrate a composition comprising

(i) 40 to 90 parts by weight of a copolymer having a glass transition temperature of −30° C. or lower and obtained from

(a) 80 to 97% by mole of one or more monomers selected from the group consisting of alkyl acrylates, alkyl methacrylates, vinyl acetate, acrylonitrile, styrene and polymerizable derivatives thereof, and

(b) 3 to 20% by mole of one or more monomers having at least one group selected from the group consisting of a carboxyl group, an alcoholic hydroxyl group and a glycidyl group and having an ethylenically unsaturated group,

(ii) a crosslinking agent having at least two crosslinkable functional groups which can react with a carboxyl group, an alcoholic hydroxyl group or a glycidyl group in an amount of 0.1 to 2.0 equivalent weight in terms of the crosslinkable functional groups per equivalent weight of the carboxyl group, the alcoholic hydroxyl group or the glycidyl group of the monomer (b) mentioned above,

(iii) 10 to 40 parts by weight of one or more liquid addition polymerizable materials having a boiling point of 200° C. or higher under atmospheric pressure and having a radical polymerizable unsaturated group,

(iv) 1 to 10 parts by weight of one or more liquid addition polymerizable materials having a boiling point of 200° C. or higher under atmospheric pressure and having at least two radical polymerizable unsaturated groups, and

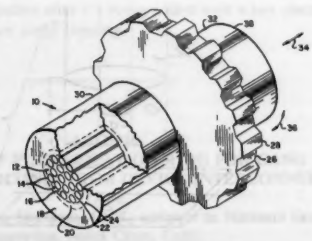
(v) 1 to 15 parts by weight of a photochemical initiator and/or a photochemical initiator system which generates free radicals by actinic light, and irradiating said composition with actinic light.

4,312,917

FIBER-REINFORCED COMPOUND COMPOSITE STRUCTURE AND METHOD OF MANUFACTURING SAME

Ronald C. Hawley, 527 W. 5th St., Winona, Minn. 55987

Filed Sep. 13, 1979, Ser. No. 75,116
Int. Cl.³ B29D *3/02*; B29F *1/10, 3/10*; D01F *8/04, 8/10*
U.S. Cl. 428—375 13 Claims



1. A compound composite structure comprising:

a composite, reinforcing insert structure comprised of a first thermoplastic resin material and fibers imbedded in said first thermoplastic resin material;

an outer casing comprised of a second thermoplastic resin material having separate, structural integrity apart from said reinforcing insert structure, said second thermoplastic resin material encasing said reinforcing insert structure and being bonded thereto; and

an intermediate bonding zone between said outer casing and said reinforcing insert structure, said bonding zone defining a zone of mixture within which said first and second thermoplastic resin materials are mixed together and thereby form a secure bond between said outer casing and said reinforcing insert structure.

4,312,918

COMPOSITIONS OF POLYETHYLENE AND A COPOLYMER OF ETHYLENE-ALKYL ACRYLATE AND THE USE THEREOF AS JACKETING ABOUT TELEPHONE WIRES AND CABLES

Robert Bostwick, Somerset, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,131
Int. Cl.³ C08L *23/06, 23/08*
U.S. Cl. 428—379 9 Claims

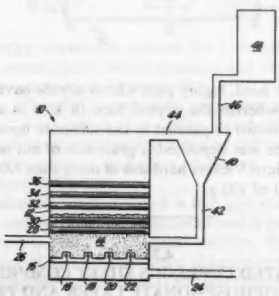
1. A composition comprising a branched, low density, high molecular weight polyethylene having a melt index of 0.08 to 0.25 and a density of 0.919 to 0.923 and a copolymer normally solid of ethylene and an alkyl acrylate wherein the combined alkyl acrylate content of said copolymer is about 16 to about 25 percent by weight, the melt index of the said copolymer is about 3 to about 24 and the said copolymer is present in an amount sufficient to pass industry standards for stress cracking resistance, in the range of about 6 to about 25 percent by weight, based on the combined weight of said polyethylene and said copolymer, said composition passing U.S. industry standards for stress cracking resistance according to Test A, the Brabender Test and Test B, the REA test as described in this specification.

4,312,919

PROCESS OF PRODUCING A NON-AGGLOMERATING VANADIUM COATED PARTICLE

John W. Devanney, 119 Rowayton Ave., Rowayton, Conn. 06853

Continuation-in-part of Ser. No. 112,529, Jan. 16, 1980. This application Sep. 12, 1980, Ser. No. 186,474
Int. Cl.³ B32B *5/16*; F23D *1/00*; B09B *3/00*; F24D *23/02*
U.S. Cl. 428—403 19 Claims



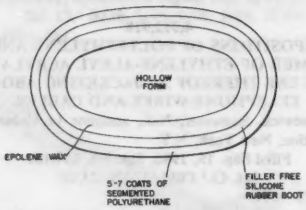
1. The process of producing a non-agglomerating vanadium coated particle comprising carrying out the combustion of a carbonaceous material containing from up to about 5,000 PPM vanadium in the presence of an oxidizing gas, said combustion also being conducted in the presence of a particulate substrate selected from a member of the group consisting of silica and magnesite whereby said vanadium is coated onto said particulate substrate.

4,312,920

POLYMER ALLOY BLOOD COMPATIBLE SURFACE

William S. Pierce, Hummelstown, and James H. Donachy, Annville, both of Pa., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Filed Nov. 7, 1979, Ser. No. 92,102
Int. Cl.³ B32B *27/40*
U.S. Cl. 428—425.5 **3 Claims**



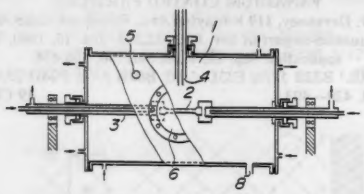
1. A blood contacting polyurethane layer having only one of its surfaces modified by alloying silicone rubber on only that modified surface and completely contained within 40 microns of said surface.

4,312,921

SUPER HARD-HIGHLY PURE SILICON NITRIDES

Toshio Hirai, and Koichi Niihara, both of Sendai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Division of Ser. No. 756,282, Jan. 3, 1977, Pat. No. 4,118,539. This application Jul. 21, 1978, Ser. No. 926,623
Claims priority, application Japan, Jan. 13, 1976, 51/2468
Int. Cl.³ C30B *29/00*
U.S. Cl. 428—446 **4 Claims**



1. A super hard, highly pure silicon nitride having a crystal orientation wherein the crystal face (h k l) in a hexagonal system is oriented in parallel to the substrate upon which the silicon nitride was deposited, a grain size of not more than 50 μm and a micro Vickers hardness of more than 3,000 Kg/mm² under a load of 100 g.

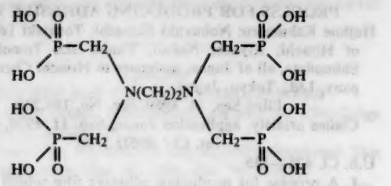
4,312,922

LUBRICATED CUPREOUS SHEET COMPRISING AN ORGANOPHOSPHONATE LAYER AND PROCESS THEREFOR

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 11, 1980, Ser. No. 111,206
Int. Cl.³ B05D *5/08*; B32B *15/18*; C23F *7/00*
U.S. Cl. 428—446 **4 Claims**

1. A lubricated cupreous sheet having a surface coating of an organophosphonate compound, said organophosphonate having the structure

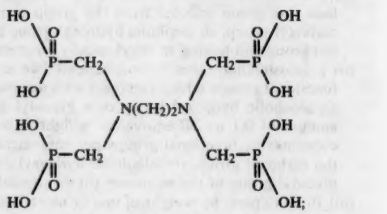


and an outer film of a lubricant retained by said coating.

3. A method of producing a lubricated cupreous sheet, comprising:

(a) providing a cupreous sheet;

(b) applying to said sheet a solution containing an organophosphonic acid and an oxidizing agent for at least 4 seconds, said acid having a structure



(c) rinsing said sheet;

(d) drying said sheet; and

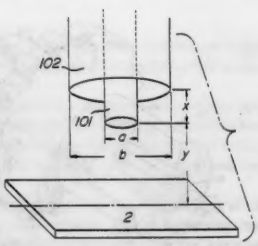
(e) applying a lubricant over the surface of said sheet.

4,312,923

SUPER HARD-HIGHLY PURE SILICON NITRIDES, AND A PROCESS AND APPARATUS FOR PRODUCING THE SAME

Toshio Hirai, and Koichi Nihara, both of Sendai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Continuation of Ser. No. 926,622, Jul. 21, 1978, abandoned, which is a division of Ser. No. 756,282, Jan. 3, 1977, Pat. No. 4,118,539. This application Feb. 11, 1980, Ser. No. 120,090
Claims priority, application Japan, Jan. 13, 1976, 51-2468
Int. Cl.³ C30B *29/00*
U.S. Cl. 428—446 **4 Claims**



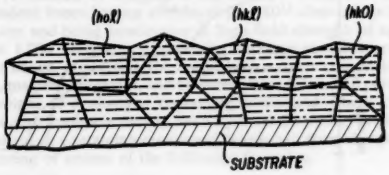
1. The super hard, highly pure silicon nitride having a crystal orientation wherein the crystal face (h 0 l) in a hexagonal system is oriented in parallel to the substrate upon which the silicon nitride was deposited, a grain size of not more than 50 μm and a micro Vickers hardness of more than 3,000 Kg/mm² under a load of 100 g.

4,312,924

SUPER HARD HIGHLY PURE SILICON NITRIDES

Toshio Hirai, and Koichi Niihara, both of Sendai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Japan

Continuation of Ser. No. 926,618, Jul. 21, 1978, abandoned, which is a continuation of Ser. No. 756,282, Jan. 3, 1977, Pat. No. 4,118,539. This application Mar. 11, 1980, Ser. No. 129,218
Claims priority, application Japan, Jan. 13, 1976, 51-2468
Int. Cl.[3] C30B *29/00*
U.S. Cl. 428—446 8 Claims



1. A super hard-highly pure silicon nitride having a hexagonal structure wherein two or more of crystal faces (h k o), (h o l) and (h k l) are preferentially oriented in parallel to a deposition surface therefor, a grain size of 1–50 μm and a micro Vickers hardness of more than 3,000 kg/mm^2 under a load of 100 g.

4,312,925

METHOD OF MANUFACTURING THE BURN AND FROSTBITE PLASTER

Bae Y. Lee, #271 Ma-Chun Dong, Gang Nam Ku, Seoul, Rep. of Korea

Filed Oct. 23, 1979, Ser. No. 67,085
Int. Cl.[3] B32B *9/00*
U.S. Cl. 428—484 1 Claim

1. The method of forming a plaster for Burns and Frostbite which can be applied directly on the affected part or wounds comprising mixing a hardened Paraffine Plaster (100% by weight) which comprises Paraffine (10%), Zinc Oxide (15%), Fat Acid (5%), Pine Resin (3%), Raw Rubber (6%), Precipitated Calcium Carbonate (51%) and Liquid Paraffine (10%) with a mixture of Resin (3%), Precipitated Calcium Carbonate (37%), Liquid Paraffine (30%) and Paraffine (15%) by letting the mixtures soften for 2 to 3 hours at a mixing rate of less than one rotation speed per second at 38 C. to 42 C. and then spreading this mixture after it's being added with a key chemical on oil paper or vinyl sheeting.

4,312,926

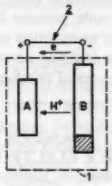
TEAR STRIP PLANARIZATION RING FOR GANG BONDED SEMICONDUCTOR DEVICE INTERCONNECT TAPE

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 14, 1980, Ser. No. 139,934
Int. Cl.[3] H01L *23/48, 29/32*
U.S. Cl. 428—571 5 Claims

1. An automatic semiconductor device assembly tape having a succession of metal finger patterns located at intervals along its length, said patterns comprising:

a plurality of metal fingers extending inwardly to form an inner array that mates with the bonding pad pattern on a semiconductor device that will be connected thereto;



a ring located inside said inner array and connected to said fingers by means of a plurality of links; and

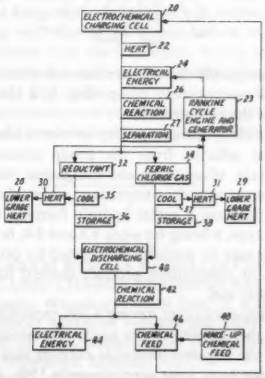
a weakened region in each of said links.

4,312,927

ENERGY CONVERSION AND STORAGE PROCESS

Oliver N. Salmon, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1980, Ser. No. 163,514
Int. Cl.[3] H01M *8/06*
U.S. Cl. 429—17 25 Claims



1. An energy conversion process for converting thermal energy into stored electrochemical energy and then into electrical energy, comprising the steps of:

(a) heating a first $FeCl_2$-containing electrolyte melt, optionally containing one or more other metal chloride compounds, in an electrochemical charging cell to cause a first chemical reaction to take place producing

(1) gaseous $FeCl_3$, and

(2) a reductant product which is free iron and/or, where said optional metal chloride compound is present and is reduced in said first chemical reaction, the reductant product of said optional metal chloride compound,

(b) separating said gaseous $FeCl_3$ and said reductant product of said reaction,

(c) cooling the resulting separated gaseous $FeCl_3$ and reductant product to a temperature lower than the temperature of said reaction,

(d) optionally storing said separated $FeCl_3$ and reductant product, and

(e) combining, at a temperature below that of said charging cell, said separated $FeCl_3$ and reductant product in a second $FeCl_2$-containing electrolyte melt in an electro-

chemical discharging cell containing electrodes, to cause a second chemical reaction to take place which is the reverse of said first reaction, thereby generating said first melt, heat, and electrical energy, said second melt comprising 3 to 33 mole percent $FeCl_2$ and 67 to 97 mole percent of one or more other metal chloride compounds which reduce the freezing point of said discharging melt or increase its electrical conductivity.

4,312,928

RECHARGEABLE ELECTROCHEMICAL CELL

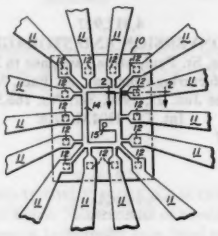
Huibert J. H. Van Deutekom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 902,712, May 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 833,301, Sep. 14, 1977, abandoned. This application Jan. 7, 1980, Ser. No. 110,435

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—27 **1 Claim**



1. A rechargeable electrochemical cell which is sealed from the external environment, comprising, in a chamber which is sealed from the environment:

a positive electrode comprising an electrochemically active material selected from the group consisting of nickel hydroxide, silver oxide and manganese oxide;

a negative electrode comprising, as an electrochemically active material a metal hydride forming material of the $LaNi_n$ type, n being between 4.8 and 5.4, in which both La and Ni may be partially substituted by other metals, said $LaNi_n$ or substitution product thereof having a $CaCu_5$ structure; and

an aqueous electrolyte having a pH exceeding 7;

wherein the quantity of the electrochemically active material of the negative electrode exceeds that of the positive electrode by at least approximately 15%, and in the fully discharged state of the positive electrode the electrochemically active compound of the negative electrode, as regards the excess, is at least partially present as a hydride, namely in the charged state.

4,312,929

POLYMERIC ELECTROLYTE FOR ELECTRO-OPTICAL DEVICE

Jean-Paul Randin, Cortaillod, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Apr. 2, 1980, Ser. No. 136,467

Claims priority, application Switzerland, May 3, 1979, 4132/79

Int. Cl.³ H01M *6/04*

U.S. Cl. 429—188 **5 Claims**

1. A polymeric electrolyte for an electrooptical device including an electrode provided with an electrochromic layer and a counter electrode, that comprises a mixture of a sulphonic protonic polymer and water in which the weight percent of water is equal to or not much less than 10800 divided by the gram equivalent weight of the polymer.

4,312,930

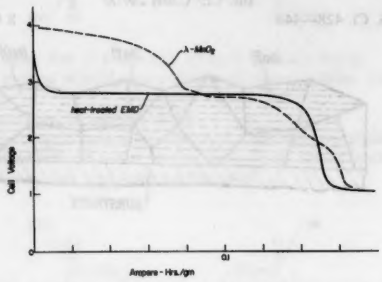
MNO_2 DERIVED FROM $LIMN_2O_4$

James C. Hunter, Berea, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 947,120, Sep. 29, 1978, Pat. No. 4,246,253. This application Aug. 25, 1980, Ser. No. 180,616

Int. Cl.³ H01M *4/50*

U.S. Cl. 429—191 **6 Claims**



1. An electrochemical cell comprising an anode, a cathode, and an electrolyte, at least a portion of said cathode comprising λ-MnO_2.

4,312,931

ZINC ELECTRODE CONTAINING POROUS CALCIUM SILICATE

Romeo R. Witherspoon, Utica, and Stuart G. Meibuhr, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1980, Ser. No. 183,264

Int. Cl.³ H01M *4/62*

U.S. Cl. 429—229 **3 Claims**

1. In an electrode for use with an alkaline electrolyte in a secondary electrochemical cell and comprising an active zinc material that forms during discharge a zincate ion, the improvement wherein said electrode also comprises an electrolyte-insoluble diatomaceous silicate material.

4,312,932

TONERS, DEVELOPERS FOR USE IN A SINGLE PASS COLOR IMAGE DEVELOPMENT

Oscar G. Hauser, Rochester, and Frederick R. Ruckdeschel, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 18, 1980, Ser. No. 179,370

Int. Cl.³ G03G *9/10*

U.S. Cl. 430—45 **10 Claims**

1. An improved developer composition for use in a single pass color imaging system, the composition consisting essentially of toner resin particles and a single carrier material, each of the resin particles containing therein from about 1 percent to about 20 percent by weight, three pigments, said pigments being selected from the cyan pigment copper tetra-4-(octadecylsulfonomido) phthalocyanine, the magenta pigment 2,9-dimethyl substituted quinacridone, the yellow pigment diarylide yellow 3,3-dichlorobenzidene aceto acetanilide or mixtures thereof.

4,312,933

METHOD OF IMAGING USING NITROGEN-CONTAINING ADDITIVES FOR MAGNETIC TONERS

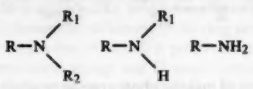
Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 11,621, Feb. 9, 1979, Pat. No. 4,291,111, which is a continuation of Ser. No. 854,861, Nov. 25, 1977, abandoned. This application Mar. 30, 1981, Ser. No. 249,042

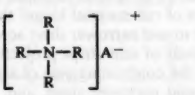
Int. Cl.[3] G03G 9/14, 13/09

U.S. Cl. 430—122 7 Claims

1. A method of imaging using a single component field dependent toner having a resistivity of 10^{11} ohm-cm to 10^{20} ohm-cm and being conductive at high field strength of up to about 1,000 volts/cm., comprising forming an electrostatic latent image, contacting the image with a toner comprising a resin, magnetic pigment, and between about 0.1 and 10 percent by weight of a nitrogen containing compound which comprises a hydrophobic moiety and a hydrophilic moiety wherein the nitrogen containing compound is selected from the group consisting of amines of the following formulas:



wherein R is an aliphatic radical containing from about 8 to about 22 carbon atoms and R_1 and R_2 are hydrocarbon radicals containing from about 1 to about 22 carbon atoms and a quaternary ammonium compound of the formula:



wherein at least one R is a hydrocarbon containing from about 8 to 22 carbon atoms and each other R is selected from hydrogen, and a hydrocarbon having from 1 to about 22 carbon atoms and A is an anion, and subsequently transferring the image to a substrate whereby substantially complete transfer of the toner results.

4,312,934

PHOTOSENSITIVE COMPOSITIONS

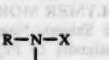
John F. Rice, Nashua, N.H.; Albert P. Yundt, Medfield, Mass., and Kenneth J. Quast, Milford, N.H., assignors to Bard Laboratories, Inc., Ameherst, N.H.

Division of Ser. No. 734,649, Oct. 21, 1976, abandoned, which is a continuation of Ser. No. 560,565, Mar. 20, 1975, abandoned. This application May 29, 1980, Ser. No. 154,312

Int. Cl.[3] G03C 5/00, 1/64

U.S. Cl. 430—294 23 Claims

1. A method for forming an image, said method comprising imagewise exposing a photosensitive composition to electromagnetic radiation in the range of ultraviolet to visible light, wherein said photosensitive composition comprises a molecularly intimate admixture of at least one basic, aromatic amine and a polymer polynitrate ester, the aromatic amine comprising a compound of the following formula:



wherein R is an aromatic nucleus substituted either directly or by nitrogen or oxygen bonds with members of the group of hydrogen, halogen, alkyl, aryl and alkaryl groups, and X and Y are selected from the group of hydrogen, hydroxyl, alkyl, aryl and alkaryl groups, provided that X and Y are not both hydroxyl, such that said aromatic amine is relatively basic, such basicity not being substantially nullified by salt or amide formation.

4,312,935

CLASS OF E-BEAM RESISTS BASED ON CONDUCTING ORGANIC CHARGE TRANSFER SALTS

Edward M. Engler, Wappingers Falls; John D. Kuptsis; Robert G. Schad, both of Yorktown Heights, and Yaffa Tomkiewicz, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 65,291, Aug. 9, 1979. This application Dec. 8, 1980, Ser. No. 213,968

Int. Cl.[3] G03C 5/04

U.S. Cl. 430—296 36 Claims

1. A method for forming negative resist images including the steps of:

(a) applying onto a substrate a uniform solid film of a conducting organic charge transfer material selected from the group consisting of halogen salts of; tetrathiafulvalene and its alkyl derivatives, tetraselenafulvalene and its alkyl derivatives, tetrathiatetracenes, tetraselenatetracenes, dithiadiselenatetracenes, tetramethylphenylenediamine, tetraselenanaphthalene, tetrathianaphthalene, dithiadiselenanaphthalene, dithiopyran, tetramethyldithiopyran, tetraphenyldithiopyran, diselenapyran, tetramethyldiselenapyran, tetraphenyldiselenapyran, dipyran, phthalocyanines and porphyrins and wherein said halogen is selected from chlorine bromine and iodine, and

(b) exposing said film to an electron-beam in a predetermined pattern, said electron-beam having sufficient energy and current density to cause cross-linking in exposed areas of said film; and

(c) treating the unexposed areas of said film with a solvent to remove said areas whereby a negative image is formed.

4,312,936

CLASS OF E-BEAM RESISTS BASED ON CONDUCTING ORGANIC CHARGE TRANSFER SALTS

Edward M. Engler, Wappingers Falls; John D. Kuptsis; Robert G. Schad, both of Yorktown Heights, and Yaffa Tomkiewicz, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 65,291, Aug. 9, 1979. This application Dec. 8, 1980, Ser. No. 213,989

Int. Cl.[3] G03C 5/04

U.S. Cl. 430—296 36 Claims

1. A method for forming positive resist images including the steps of:

(a) applying onto a substrate a uniform solid film of a conducting organic charge transfer material selected from the group consisting of halogen salts of; tetrathiafulvalene and its alkyl derivatives, tetraselenafulvalene and its alkyl derivatives, tetrathiatetracenes, tetraselenatetracenes, dithiadiselenatetracenes, tetramethylphenylenediamine, tetraselenanaphthalene, tetrathianaphthalene, dithiadiselenanaphthalene, dithiopyran, tetramethyldithiopyran, tetraphenyldithiopyran, diselenapyran, tetramethyldiselenapyran, tetraphenyldiselenapyran, dipyran, phthalocyanines and porphyrins and wherein said halogen is selected from chlorine bromine and iodine, and

(b) exposing said film to an electron-beam in a predetermined pattern, said electron-beam having sufficient energy and current density to cause said film to voltalize in exposed areas whereby a positive image is formed.

4,312,937
PHOTOGRAPHIC NEGATIVE BASE FOR SELF-DEVELOPING FILM PACKS

Klaus B. Kasper; William L. Quartz, both of Pulaski, and William H. Myers, Sandy Creek, all of N.Y., assignors to Schoeller Technical Papers, Inc., Pulaski, N.Y.

Filed Apr. 11, 1980, Ser. No. 139,291
Int. Cl.³ G03C *1/86*; B32B *27/08*
U.S. Cl. 430—496 **15 Claims**

1. A low caliper photographic film assembly substantially free of optical pinholes suitable for use as a base for negatives in self-developing photographic film packs, said assembly comprising:

(a) a layer of paper, said paper layer being characterized by:
(i) a caliper of from about 2.0 mils to about 4.5 mils, and
(ii) a basis weight of from about 55 g/m^2 to about 125 g/m^2;

(b) a first layer of polyolefin extrusion coated on a first surface of said paper layer, said first polyolefin layer being characterized by a total weight of from about 10 g/m^2 to about 48 g/m^2;

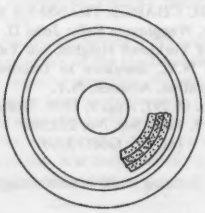
(c) a second layer of polyolefin extrusion coated on a second surface of said paper layer, said second polyolefin layer being characterized by a total weight of from about 10 g/m^2 to about 48 g/m^2;

said film assembly containing from about 2.5 g/m^2 to about 4.0 g/m^2 of carbon black, said carbon black being substantially uniformly dispersed in at least two of said layers of said film assembly.

4,312,938
METHOD FOR MAKING A BROADBAND REFLECTIVE LASER RECORDING AND DATA STORAGE MEDIUM WITH ABSORPTIVE UNDERLAYER

Jerome Drexler, Los Altos Hills, and Eric W. Bouldin, Atherton, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Division of Ser. No. 140,136, Apr. 14, 1980, Pat. No. 4,284,716, which is a continuation-in-part of Ser. No. 55,270, Jul. 6, 1979, Pat. No. 4,278,256, and a continuation-in-part of Ser. No. 121,732, Feb. 15, 1980, abandoned. This application Oct. 17, 1980, Ser. No. 198,242
Int. Cl.³ G03C *5/24*, *5/54*
U.S. Cl. 430—496 **15 Claims**



1. A negative photographic process for making a reflective optical data storage medium comprising

areawise exposing a silver-halide emulsion photosensitive medium to a uniform non-saturating level of actinic radiation,

developing said emulsion to a gray color having an optical density to red light of between 0.05 and 2.0, the optical density being directly related to the exposure, while leaving both exposed, developed silver and unexposed, undeveloped silver halide in place,

forming an areawise layer of silver precipitating nuclei on the surface of said developed emulsion at sites of undeveloped silver halide,

contacting said developed and nucleated emulsion with a monobath comprising a silver-halide solvent and a silver reducing agent, whereby unexposed and undeveloped silver halide forms soluble silver complexes and is transported by diffusion transfer to said precipitating nuclei where said silver complexes are reduced to metallic silver, leaving exposed developed silver in place, thereby producing a layer of reflective metallic primarily non-filamentary silver over a gray layer of primarily filamentary silver.

4,312,939
PHOTOGRAPHIC PRODUCT AND PROCESS OF MAKING THE SAME

Thomas P. McCole, South Natic, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 18, 1980, Ser. No. 141,367
Int. Cl.³ G03C *1/40*, *1/48*
U.S. Cl. 430—497 **13 Claims**

1. In a process of making photographic products, the steps of superposing first and second elongated sheets of material of different widths with the sheets parallel and the narrower sheet disposed in contact with and intermediate the edges of the wider sheet, one of said sheets having a photosensitive coating thereon on the side facing the other sheet, securing said sheets together at a series of spaced locations by adhering narrow elongated strips of rail material longer than the width of said narrower sheet to said narrower sheet across the width thereof and adhering ends of said strips projecting beyond said narrower strip to the confronting side of said wider sheet in regions beyond said narrower sheet, and, repetitively and sequentially, a plurality of times, severing said joined sheets and one of said strips along a line normal to said sheets to produce an edge along which said sheets are joined by an extended rail element half the width of the severed strip, advancing said edge into contact with a transverse portion of an elongated web of masking material formed with apertures to define image areas and side portions extending beyond the width of said wider sheet, adhering said wider sheet to said transverse portion along said edge, severing said sheets and the next following strip to produce a detached unit connected at said edge to said masking sheet and having a second edge along which detached portions of said narrower and wider sheets are joined by an extended rail element half the width of the strip just severed and producing a new edge on said joined sheets along which said sheets are joined by an extended rail element comprising the other half of the strip just severed, and advancing said masking web a distance greater than the distance between the joined edges of the severed portion of said sheets to bring a new transverse portion of said masking web into the position at which said first recited edge was adhered to said first recited transverse portion.

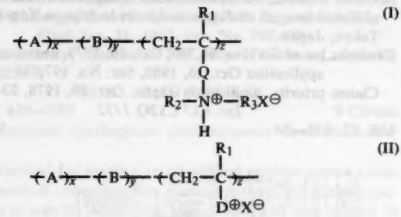
4,312,940
PHOTOGRAPHIC MATERIAL CONTAINING A NOVEL POLYMER MORDANT

Taku Nakamura, and Shigeru Nagatomo, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 71,617, Aug. 31, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,290
Claims priority, application Japan, Aug. 31, 1978, 53-106851
Int. Cl.³ G03C *1/84*
U.S. Cl. 430—510 **17 Claims**

1. A silver halide photographic light-sensitive material comprising at least one gelatino layer containing a polymer disper-

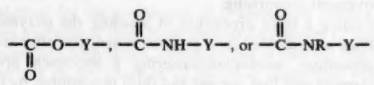
sion of the following formula (I) or (II) as a mordant capable of mordanting an acid dye, which material is subjected to alkali processing to remove mordanted acid dye



(I)

(II)

where A represents a monomer unit obtained from at least one monomer having at least two copolymerizable ethylenically unsaturated groups at least one of which is in the side chain: B represents a monomer unit obtained from at least one copolymerizable monoethylenically unsaturated monomer; $D^{\oplus}$ represents a 5- or 6-membered heterocyclic ring containing one or two nitrogen atoms one of which is positively charged to form a tertiary ammonium group and D may contain one or more substituents; R_1 represents a hydrogen atom or a lower alkyl group; R_2 and R_3, which may be the same or different, each represents an alkyl group or an aralkyl group, or R_2 and R_3 combine together with the nitrogen atom to which they are attached and form a 5- or 6-membered ring; $X^{\ominus}$ represents an anion; Q represents an alkylene group, a phenylene group, an aralkylene group or a group of the formula



wherein Y represents the alkylene group or an aralkylene group and R represents an alkyl group; and x, y and z represent the molar percentage of the respective units in the polymer and x is about 0.5 to 10%, y is about 0 to 60% and z is about 30 to 99.5%.

4,312,941

PHOTOGRAPHIC MATERIALS WITH ANTIHALATION MEANS BASED UPON SILVER HALIDE EMULSIONS

Martin Scharf, Köthen, and Ulrich Meisel, Dessau, both of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.

Filed May 29, 1980, Ser. No. 154,249

Claims priority, application German Democratic Rep., May 31, 1979, 213280

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—510 **12 Claims**

1. A photographic material based upon silver halide emulsions, comprising

(A) an emulsion layer containing at least one diffusible filtering dye and possessing maximum degree of sensitivity in a spectral range, and

(B) an antihalation layer disposed immediately over said emulsion layer,

(1) having a maximum degree of absorption in the spectral range of the maximum sensitivity of said emulsion layer,

(2) having an optical density of at least 0.10 in the spectral range of the maximum sensitivity of said emulsion layer, and

(3) containing at least one mordant in an amount suitable for fixing dye diffusing into said antihalation layer from said emulsion layer.

4,312,942

PROCESS FOR THE EXTRACTION OF MICROORGANISMS AND DIAGNOSTIC AGENTS CONTAINING THEM

Hans-Georg Blobel, Leihgestern; Werner Schaeg, Giessen, and Jörg Brückler, Heuchelheim, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 837,816, Sep. 29, 1977, abandoned. This application Oct. 6, 1977, Ser. No. 839,846

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644622

Int. Cl.³ C12Q *1/56;* C12R *1/08;* C12N *1/20*

U.S. Cl. 435—7 **15 Claims**

1. A method for eliminating undesirable portions of a Staphylococcus microorganism selected from the group consisting of Clumping Factor-positive Staphylococcus microorganisms and Staphylococcus microorganisms containing F_c-reactive protein A and capable of entering into a binding reaction with the F_c part of an antibody molecule, which method comprises extracting such a microorganism with a 4 to 8 molar solution of a guanidine salt under conditions sufficient to remove coagulase, non-characterized proteins tending to cause agglutination, and other interfering proteins from said microorganism, subsequently washing said microorganism to remove the guanidine salt therefrom, and recovering a Clumping Factor-positive Staphylococcus microorganism which is free of proteins interfering with use of the microorganism as a diagnostic agent for the detection of fibrinogen or fibrin fission products or recovering a Staphylococcus microorganism containing F_c-reactive protein A which is free of proteins interfering with use of the microorganism, when bound to the F_c-part of immune globulin, as a diagnostic for determining antigens.

15. An extracted clumping Factor-positive *Staphylococcus aureus* K 807 (ATCC 31243) free of coagulase, non-characterized proteins tending to cause agglutination, and other proteins interfering with use of the microorganism as a diagnostic agent for the detection of fibrinogen or fibrin fission products.

4,312,943

METHOD FOR ENZYME IMMUNOASSAY OF PANCREATIC GLUCAGON

Susumu Iwasa, Kyoto; Hayao Ueno, Osaka, and Mitsuhiro Wakimasu, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 24, 1979, Ser. No. 69,180

Claims priority, application Japan, Aug. 30, 1978, 53/106828

Int. Cl.³ G01N *33/54;* C12N *9/96*

U.S. Cl. 435—7 **20 Claims**

1. A peptide-enzyme conjugate obtained by coupling a reactive substituent group of a labeling enzyme and of a peptide of the formula:

H-R_1-Phe-Val-Gln-Trp-Leu-R_2-Asn-Thr-OH wherein R_1 is a peptide fragment selected from the group consisting of Asp, Gln-Asp, Ala-Gln-Asp, Arg-Ala-Gln-Asp, Arg-Arg-Ala-Gln-Asp, Ser-Arg-Arg-Ala-Gln-Asp, Asp-Ser-Arg-Arg-Ala-Gln-Asp, Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp, Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp and β-Ala-Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp, and wherein R_2 is Met or Nle.

7. A method of enzyme immunoassay of pancreatic glucagon which comprises reacting a peptide-enzyme conjugate obtained by coupling a reactive substituent group of labeling enzyme and of a peptide of the formula:

H-R_1-Phe-Val-Gln-Trp-Leu-R_2-Asn-Thr-OH wherein R_1 is a peptide fragment selected from the group consisting of Asp, Gln-Asp, Ala-Gln-Asp, Arg-Ala-Gln-Asp, Arg-Arg-Ala-Gln-Asp, Ser-Arg-Arg-Ala-Gln-Asp, Asp-Ser-Arg-Arg-Ala-Gln-Asp, Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp, Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp and β-Ala-Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp, and wherein R_2 is Met or Nle, a test fluid, a plasma and an anti-glucagon antibody competitively and measuring the amount of

pancreatic glucagon in the test fluid by detecting the enzyme activity in the liquid or solid phase.

9. A peptide-enzyme conjugate obtained by coupling a reactive substituent group of a labelling enzyme and of a peptide of the formula:

H-R_3-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-OH wherein R_3 is a peptide fragment selected from the group consisting of Asp, Gln-Asp, Ala-Gln-Asp, Arg-Ala-Gln-Asp, Arg-Arg-Ala-Gln-Asp, Ser-Arg-Arg-Ala-Gln-Asp, and Asp-Ser-Arg-Arg-Ala-Gln-Asp.

17. A method of enzyme immunoassay of pancreatic glucagon which comprises reacting a peptide-enzyme conjugate obtained by coupling a reactive substituent group of a labeling enzyme and of a peptide of the formula:

H-R_3-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-OH wherein R_3 is a peptide fragment selected from the group consisting of Asp, Gln-Asp, Ala-Gln-Asp, Arg-Ala-Gln-Asp, Arg-Arg-Ala-Gln-Asp, Ser-Arg-Arg-Ala-Gln-Asp, and Asp-Ser-Arg-Arg-Ala-Gln-Asp, a test fluid, a plasma and an anti-glucagon antibody competitively and measuring the amount of pancreatic glucagon in the test fluid by detecting the enzyme activity in the liquid or solid phase.

4,312,944

CARRYING OUT ASSAYING METHODS INVOLVING BIOSPECIFIC REACTIONS

Bo G. Mattiasson, Trädgardsnästaren 26, S-222 48 Lund, Sweden, and Torbjörn G. I. Ling, Tellusgatan 16, S-223 57 Lund, Sweden, assignors to Bo Gustav Mattiasson and Torbjörn Gösta Ingvar Ling, both of Lund, Sweden

Filed Nov. 26, 1979, Ser. No. 97,176

Claims priority, application Sweden, Nov. 28, 1979, 7812237

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **4 Claims**

1. The improvement in carrying out, in the presence of an aqueous liquid, assaying methods involving biospecific affinity reactions in which there are used from two to four reactants, one of which reactants, reactant (I), being labelled with at least one analytically indicatable atom or group and being soluble in the aqueous liquid wherein the biospecific affinity reaction is carried out, said reactants forming by biospecific affinity reactions a conjugate in which labelled reactant (I) is incorporated, and in which methods the analytically indicatable atom or group is assayed in at least one member of the group comprising the conjugate and the labelled reactant (I), which is not bound to the conjugate, which comprises

(a) using as at least one of said reactants a reactant which is modified in such a way that conjugate and labelled reactant (I), which is not bound to the conjugate, are asymmetrically partitioned in a system of two immiscible aqueous liquid phases, due to differences in physical affinity of the molecules to at least one of the two phases, which system in addition to water comprises in dissolved form,

(i) at least two water-soluble polymers, or

(ii) at least one water-soluble polymer at at least one water-soluble salt, or

(iii) at least one water-soluble polymer and at least one water-soluble organic solvent,

(b) providing said system of two aqueous liquid phases,

(c) partitioning of conjugate and labelled reactant (I) which is not bound to the conjugate, in said system of two aqueous liquid phases by the addition thereof to said system and allowing the phases to separate,

and

(d) assaying the analytically indicatable atom or group in at least one of the phases.

4,312,945

METHOD AND APPARATUS OF MEASURING THE SPECIFIC ACTIVITY OF DEHYDROGENASES IN TISSUE

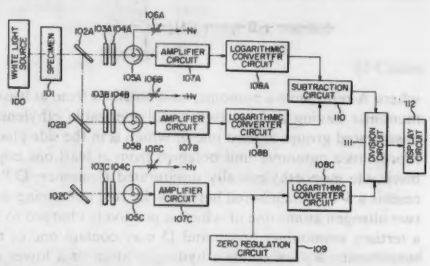
Masaoki Yamada, Tokushima; Kenji Onogi, and Ryozo Ito, both of Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 84,749, Oct. 15, 1979, abandoned. This application Oct. 16, 1980, Ser. No. 197,618

Claims priority, application Japan, Oct. 19, 1978, 53-128923

Int. Cl.³ C12Q *1/32*

U.S. Cl. 435—26 **9 Claims**



1. A method of measuring the specific activity of dehydrogenases by using a specimen prepared through a first procedure of causing dehydrogenases in tissue flake to be measured to be reacted with a substrate for a predetermined time and dyeing the same with tetrazolium salt and a second procedure of dyeing the protein in said flake with naphthol yellows, the improvement comprising:

providing a third procedure of washing the enzyme-dyed flake with alcohol for a predetermined time after said first procedure, microphotometering a specimen prepared through said first, second and third procedures, by the use of three predetermined wavelengths in the vicinity of 450 nm, 570 nm and 700 nm to obtain the degree of light absorption, I, at each of said predetermined wavelengths, and applying said values to the formula

$$I_{570}/I_{450}-I_{700}$$

to thereby obtain said specific activity, and measuring the specific activity of the dehydrogenases from data obtained corresponding to the respective wavelengths.

4,312,946

PREPARATION AND USE OF ENZYMES BOUND TO POLYURETHANE

Louis L. Wood, Rockville; Frank J. Hartdegen, and Peter A. Hahn, both of Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application May 21, 1973, Ser. No. 362,488

Int. Cl.³ C07G *7/02*

U.S. Cl. 435—182 **12 Claims**

1. The method of preparing a bound enzyme that includes contacting, prior to a subsequent foaming step, an isocyanate-capped polyurethane with an aqueous dispersion of an enzyme, under foam-forming conditions, whereby the polyurethane foams and the enzyme becomes integrally bound to the thus formed polyurethane foam.

4,312,947

PROCESS FOR THE PREPARATION OF A VACCINE AGAINST PANLEUCOPENIA OF THE CAT

Othmar Ackermann, Marburg, and Helmut Stegmann, Rüchenbach, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,438

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602478

Int. Cl.³ C12N 7/08, 7/00

U.S. Cl. 435—237 9 Claims

1. Attenuated apathogenic panleucopenia virus strain Bw 103.

2. A method for making an attenuated panleucopenia virus, which method comprises first passing pathogenic panleucopenia virus at least 80 times in cat kidney cells and then at least 18 times in a permanent cat kidney cell strain according to Crandell.

4,312,948

ENZYMIC MICROBIOLOGICAL PROCESS FOR PRODUCING OPTICALLY ACTIVE AMINOACIDS STARTING FROM HYDANTOINS AND/OR RACEMIC CARBAMOYL DERIVATIVES

Roberto Olivieri, Mentana; Aurelio Viglia, Monterotondo; Ludwig Degen, Rome; Leonello Angelini, Monterotondo, and Eugenio Fascetti, Rome, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed May 11, 1979, Ser. No. 38,232

Claims priority, application Italy, May 23, 1978, 23679 A/78

Int. Cl.³ C12N 1/20; C07B 19/02

U.S. Cl. 435—253 6 Claims

1. Method for the production of D-aminoacid starting from racemic mixtures of their N-carbamoyl derivatives or from the corresponding hydantoins, characterized in that the reaction is carried out in the pressure of enzymic complexes obtained from a microorganism of the Agrobacterium genus identified by the symbol NRRL B 11291.

6. A biologically pure culture of Agrobacterium NRRL B 11291, said culture being capable of producing D-aminoacids from racemic mixtures of their N-carbamoyl derivatives or the corresponding hydantoins.

4,312,949

METHOD FOR THE PREPARATION OF A GAMMA GLOBULIN SOLUTION SUITABLE FOR INTRAVENOUS USE

Ulrich E. Ahrens, Springe, Fed. Rep. of Germany, assignor to Blutspendedienst det Landesverbande des Deutschen Roten Kreuzes Niedersachsen, Oldenburg und Bremen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 65,975, Aug. 13, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,687

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835843

Int. Cl.³ C07G 7/00

U.S. Cl. 435—272 7 Claims

1. A method of producing a gamma globulin solution suitable for intravenous use, comprising the following steps in the following sequence: treating a solution of gamma globulin fraction of plasma or serus with a DEAE cellulose-type ion-exchange substance, subjecting the solution to ultrafiltration to yield a concentrate, treating the concentrate with an activated charcoal-type absorbing substance and separating purified concentrate from the absorbing substance, treating the purified concentrate with a peptic enzyme at a pH value of about 4, treating the solution thus obtained with an activated charcoal-type absorbing substance and separating the absorbing substance from the solution.

4,312,950

DISPOSABLE SWAB AND CULTURE UNIT

Thomas A. Snyder, Willow Grove, and Walter T. Leible, Warminster, both of Pa., assignors to Hillwood Corporation, Warminster, Pa.

Filed Mar. 31, 1980, Ser. No. 135,422

Int. Cl.³ C12M 1/30

U.S. Cl. 435—295 5 Claims

1. A disposable swab and culture unit comprising:

(a) a generally hollow cylinder having a closed end and and open end capped by a cap placed in sliding telescoping contact over said cylinder;

(b) a swab comprising a shaft with a specimen collecting tip at one end, the other end of the shaft being attached to interior of the cap in such a manner that the swab is disposed inside the cylinder and may be moved along the axis of the cylinder by the telescoping movement of the cap;

(c) a liquid culture medium within the cylinder;

(d) a conical plug having a base portion slightly larger than the diameter of the bore of the cylinder, the plug being inserted within the bore of said cylinder with the conical face thereof facing the specimen collecting tip of the swab to form a sealed chamber in the portion of said cylinder between the closed end and the plug for containing the liquid culture medium, said plug being pivotable, by contact of the specimen collecting tip of the swab against the conical face of the plug when the cap is moved in sliding telescoping contact over the cylinder, to a position where it no longer forms a sealed chamber.

4,312,951

LOW-MELTING, LEAD-FREE CERAMIC FRITS

Richard A. Eppler, Timonium, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 7, 1979, Ser. No. 73,609

Int. Cl.³ C03C 1/00, 5/00, 3/08

U.S. Cl. 501—24 7 Claims

1. A lead-free, low melting and durable glass frit composition adapted to have an incipient fusion point below about 475° C. and a solubility in water of less than 0.6 percent; measured by exposure to water at 100° C. for one hour, the glass frit consisting essentially of on a weight basis:

13 to 24 parts alkali oxide selected from 0 to 22 parts Na_2O, 0 to 6 parts Li_2O, and 0 to 22 parts K_2O;

14 to 27 parts B_2O_3;

2 to 8 parts Al_2O_3;

35 to 55 parts SiO_2;

0.75 to 4 parts F;

at least 5 parts other oxide selected from 0 to 6 parts TiO_2, 0 to 11 parts ZnO, and 0 to 5 parts P_2O_5, provided that at least two of said oxides are included in measurable amounts; and

provided that the sum of all parts, exclusive of F, totals 100 weight parts.

4,312,952

FIBRE GLASS COMPOSITION

Vlastimil Carbol, Växjö, Sweden, assignor to Oy Partek AB, Pargas, Finland

Filed Apr. 11, 1980, Ser. No. 139,423
Claims priority, application Sweden, May 9, 1979, 7904044
Int. Cl.³ C03C *13/00, 3/08*
U.S. Cl. 501—36 **1 Claim**

1. A fibre glass composition characterized in that it consists of

	by weight
SiO_2	58–62
Al_2O_3	1–2
CaO	8–9.5
MgO	2.5–3.5
Na_2O	15–17
K_2O	0–1
B_2O_3	5–7
BaO	—
Li_2O	0.1–0.4
Fe_2O_3	traces
ZnO	1.5–3.5.

4,312,953

OLIVE-GREEN GLASS COMPOSITIONS

Harry N. Mills, and John Jasinski, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 29, 1981, Ser. No. 229,439
Int. Cl.³ C03C *3/04, 3/30*
U.S. Cl. 501—71 **5 Claims**

1. An olive-green colored reduced glass composition in which the glass is a soda-lime-silicate glass consisting essentially of the following ingredients in approximate % by weight:

Fe_2O_3	0.1–0.4
S^{-2}	0.01–0.04
Cr_2O_3	0.02–0.2

4,312,954

SINTERED SILICON CARBIDE CERAMIC BODY

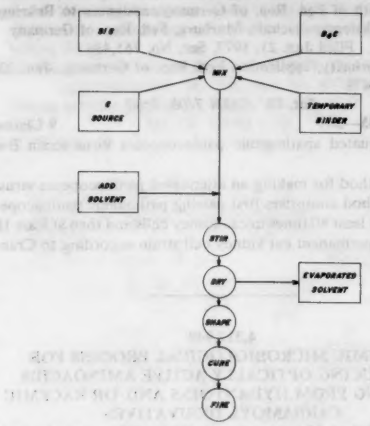
John A. Coppola, Lewiston; Lawrence N. Hailey, Niagara Falls, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Filed Jun. 5, 1975, Ser. No. 584,226
Int. Cl.³ C04B *35/56*
U.S. Cl. 501—90 **45 Claims**

1. A pressureless sintered ceramic body consisting essentially of:

(a) from about 91 to about 99.35% by weight silicon carbide, the silicon carbide comprising at least about 5% by weight of alpha, non-cubic crystalline silicon carbide;

(b) from about 0.5 to about 5.0% uncombined carbon;



(c) from about 0.15 to about 3.0% boron; and

(d) up to about 1.0% additional carbon; and having a density of at least about 3.05 g/cc.

4,312,955

PROCESS FOR THE PRODUCTION OF METHANOL FROM SYNTHESIS GAS

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,926
Int. Cl.³ C07C *27/06, 31/04*
U.S. Cl. 518—701 **48 Claims**

1. A process for the selective production of methanol comprising contacting a mixture of hydrogen and carbon monoxide with a catalytic amount, sufficient to catalyze the reaction, of lanthanum rhodate having a perovskite structure, wherein the hydrogen to carbon monoxide mole ratio is from 20:1 to 1:20 and the reaction is carried out at a pressure of from 100 psig to 15000 psig and a temperature of from 150° C. to 450° C.

4,312,956

FILTRATION AND DEIONIZATION PREPARED FROM CATIONIC AND ANIONIC EMULSION ION EXCHANGE RESINS

Berni P. Chong, North Wales; Eric G. Isacoff, Richboro, and James W. Neely, Horsham, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 943,890, Sep. 18, 1978. This application Jun. 18, 1979, Ser. No. 49,538
Int. Cl.³ B01J *47/04;* C02F *1/56*
U.S. Cl. 521—28 **10 Claims**

1. A process for the removal of cationic impurities, anionic impurities, particulate impurities and mixtures thereof from a liquid containing these impurities, which process comprises the steps of:

(a) contacting the liquid with a floc of beads of one or more cation exchange resins and beads of one or more anion exchange resins in a weight ratio of from about 9:1 to about 1:9 cation resin to anion resin, the beads of each resin being approximately spherical beads of crosslinked emulsion copolymer having diameters within the range from about 0.01 to about 1.5 micrometers and bearing from about 0.7 to about 1.5 ion exchange functional groups per monomer unit, and

(b) separating the floc from the liquid.

4,312,957

FAST-COOLING STYRENE POLYMER FOAMS

John P. Spicuzza, Jr., Mt. Lebanon, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 1, 1980, Ser. No. 193,338
Int. Cl.[3] C08V 9/18
U.S. Cl. 521—60 10 Claims

1. Method of making foamable styrene polymer particles which yield a fast cooling foamed molding comprising the steps of:

(a) suspending styrene polymer particles in water with the aid of a suspending agent system;

(b) adding 3 to 20 weight percent of a blowing agent and 0.1 to 0.6 weight percent of a synergistic mixture of (1) a first surfactant selected from the group consisting of polyoxyethylene sorbitan monoesters of fatty acids, polyoxyethylene monoesters of fatty acids, and polyoxyethylene monoethers of long-chain fatty alcohols and (2) a second surfactant selected from the polyoxyethylene monoethers of alkylphenols, wherein the polyoxyethylene moieties contain from 10 to 50 moles of ethylene oxide per molecule, the fatty acids and alcohols contain from 10 to 18 carbon atoms per molecule, and the alkyl portion of the alkylphenols contains from 8 to 12 carbon atoms wherein said synergistic mixture consists of a ratio of said first surfactant to said second surfactant of between 3 to 1 and 1 to 1;

(c) heating the suspension at a temperature of from 80° to 150° C. to impregnate the polymer particles with blowing agent and the mixed surfactants; and

(d) separating the impregnated particles from the aqueous system.

4,312,958

FIRE-RETARDANT, RUBBER-MODIFIED, MONOCARBOXYLIC ACID COPOLYMERS

Adolph V. DiGiulio, Wayne, and Jack N. Bauer, Pittsburgh, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 147,035, May 7, 1980, Pat. No. 4,286,070.
This application Apr. 17, 1981, Ser. No. 254,846
Int. Cl.[3] C08J 9/00
U.S. Cl. 521—88 5 Claims

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a rubber-modified copolymer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenyether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether; said rubber-modified copolymer consisting of (a) 5 to 40 weight percent of a rubber selected from the group consisting of homopolymers of conjugated dienes, copolymers of said conjugated dienes with up to 50 weight percent of one or more monoolefinically unsaturated monomers, ethylene-propylene-diene terpolymer rubbers, acrylate-diene copolymer rubbers and mixtures thereof and (b) 95 to 60 weight percent of a copolymer of 70 to 95 mole percent of a monovinyl aromatic monomer and 5 to 30 mole percent of an ethylenically unsaturated monocarboxylic acid monomer.

4,312,959

NOVEL CATALYST COMPOSITIONS AND METHOD FOR PREPARING POLYURETHANE FOAMS USING SAME

Kenneth Treadwell, Rahway, and Emily C. Bossert, Westfield, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 128,848, Mar. 10, 1980, abandoned. This application Feb. 17, 1981, Ser. No. 234,525
Int. Cl.[3] C08G 18/24, 18/14, 18/16
U.S. Cl. 521—107 46 Claims

1. In a method for preparing flexible urethane foams by reacting a polyether polyol with an isocyanate in the presence of a gel catalyst and a blowing agent, the improvement therein which comprises using a gel catalyst composition comprising

(a) a halogenated mono- or diorganotin ester of a phosphorus compound, or

(b) a halogenated mono- or diorganotin compound and an organotin ester of a phosphorus compound, where halogen in (a) is bonded to tin or phosphorus and halogen in (b) is bonded to tin, and the phosphorus compound in (a) and (b) is selected from the group consisting of monomeric and condensed phosphoric acids, thiophosphoric, phosphorous, phosphinic, phosphinous, phosphonous and phosphonic acids, phosphoryl chloride and oligomeric condensation products of (1) phosphonic acid, (2) mixtures containing phosphoric and phosphonic acids or (3) esters of phosphoric and phosphorous acids and alcohols containing from 1 to 20 carbon atoms, and wherein the tin in said organotin compounds is in the tetravalent state, said foam having improved resiliency and heat stability.

23. A composition comprising

(a) a mono- or dicarboxylic acid containing from 2 to 20 carbon atoms and

(b) a halogenated mono- or diorganotin ester of a phosphorus compound selected from the group consisting of monomeric acid condensed phosphoric acids, thiophosphoric, phosphorous, phosphinic, phosphinous, phosphonous and phosphonic acid, phosphoryl chloride and oligomeric condensation products of (1) phosphonic acid, (2) mixtures containing phosphoric and phosphonic acids or (3) esters of phosphoric and phosphorous acids and alcohols containing from 1 to 20 carbon atoms, and wherein the tin in organotin ester is in the tetravalent state.

4,312,960

FOAM CRYSTALLIZATION OF CONDENSATION POLYMERS

Morris R. Ort, Wilbraham, and Elizabeth L. Newell, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 4,433, Jan. 18, 1979, Pat. No. 4,224,264.
This application Apr. 21, 1980, Ser. No. 142,551
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.[3] C08G 63/00
U.S. Cl. 521—182 6 Claims

1. A solid closed cell foam of crystallized linear aromatic polyester having a heat of fusion in the range of about 12 to about 40 J/g obtained by melting a normally amorphous polyester, dispersing a chemical blowing agent therein, extruding the melt to form a solid foam and maintaining the solid foam at a temperature above the glass transition temperature of the polyester until crystallization occurs.

4,312,961

POLYMERIC FLUOROCARBON ROTOMOLDING/ROTOLINING COMPOSITION

Donald L. Winegar, Kettering, and Joseph M. Arde, Jr., Clarksville, both of Ohio, assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Jan. 5, 1981, Ser. No. 222,571
Int. Cl.[3] C08K 3/10
U.S. Cl. 525—4 18 Claims

1. A perfluoroalkoxy side chain modified fluorocarbon base polymer composition useful in melt-processing applications to produce bubble-free moldings, said composition including tin as an addition agent in effective amount to reduce bubbling.

10. The method of treating perfluoroalkoxy side chain modified fluorocarbon base polymers preparatory to melt-processing them to form molded shapes, which comprises

compacting the "as received" polymer particulate under a pressure of at least about 8000 psi to produce a solid compact;

grinding said compact to again reduce the polymer to pow-

der form and screening it to achieve particles of uniform size which pass through a sieve of 35 mesh; and

incorporating into said polymer powder at some point before melt-processing it a small but significant amount of metallic tin sufficient to inhibit bubble formation in the polymer during melt-processing.

4,312,962
ADHESION IN METAL PLATING

Joseph O. Campbell, Springfield, and Marie Y. Jean-Pierre, Shrewsbury, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 23, 1981, Ser. No. 237,229
Int. Cl.³ C08L *55/02, 35/06;* C08K *5/10*
U.S. Cl. 525—5 **5 Claims**

1. A method of improving the adhesion between an electroplated metal layer and a substrate polymer composition comprising

A. at least 20% by weight of a copolymer of a vinylaromatic monomer and an ethylenically unsaturated dicarboxylic acid anhydride in a weight ratio of from 95:5 to 65:35 with from 0–20% of the copolymer weight of a copolymerizable monomer; and

B. a copolymer formed by polymerizing a vinylaromatic monomer and an unsaturated nitrile in the presence of a rubber having a glass transition temperature below 0° C.

which method comprises incorporating into the polymer composition from 0.5 to 2.5% by weight, based on the composition weight, of a C_1 to C_6 alkylester of a C_{12}–C_{20} saturated fatty acid or mixture of such esters.

4,312,963
STABILIZATION OF HIGH RESILIENCE POLYURETHANE FOAM

Kiran B. Chandalia, Cheshire, and Henry G. Barnowski, Durham, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 6,951, Jan. 25, 1979, Pat. No. 4,278,770, which is a continuation-in-part of Ser. No. 898,274, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 881,297, Feb. 27, 1978, abandoned. This application Jan. 22, 1981, Ser. No. 227,312
Int. Cl.³ C08L *27/06*
U.S. Cl. 525—56 **9 Claims**

1. A polyol composition comprising a polyether polyol including a proportion of an effectively dispersed finely divided solid particulate material having an effective maximum particle size in dispersion of less than about 75 microns, said polyol being a polyether polyol having a molecular weight of at least about 1,500, a polyhydroxy alcohol nucleus having a functionality from about 2 to about 8, polyoxyalkylene chain segments attached to said nucleus, and a ratio of primary to secondary hydroxyl end groups ranging from about 1.5:1 to about 5.5:1.

4,312,964
POLYOLEFIN RESIN COMPOSITION

Noriyuki Sekine; Shigeo Tanaka, and Kazuo Tanaka, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 85,411, Oct. 16, 1979, abandoned. This application Aug. 14, 1980, Ser. No. 177,946
Claims priority, application Japan, Oct. 19, 1978, 53-129155; European Pat. Off., Oct. 18, 1979, 7930226.9
Int. Cl.³ C08L *23/08*
U.S. Cl. 525—88 **5 Claims**

1. A polyolefin resin composition which comprises an ethylene/propylene block copolymer (A) consisting essentially of at least one first segment of an ethylene/propylene copolymer having an ethylene content of 0.5 to 2.5% by weight, and at least one second segment of an ethylene/propylene copolymer having an ethylene content of 15 to 35% by weight, said second segment being contained in a proportion of 10 to 30% by weight based on the weight of the block copolymer (A), and

a polymer of ethylene (B) selected from the group consisting of polyethylene and a copolymer of ethylene and an α-olefin having 3 or more carbon atoms, which has a density of 0.93 to 0.97 g/cm³ and a melt flow index of 2.0 to 50 g/10 minutes at 190° C., said composition having a ratio (R) of the weight of the polymer of ethylene (B)/the weight of the second segment of the block copolymer (A) satisfying the following formula: $0.70 \leqq R \leqq 2.2$

4,312,965
PROCESS FOR FORMING AMINE/AMIDE CONTAINING POLYMERS

Felek Jachimowicz, and Joseph W. Raksis, both of Columbia, Md., assignors to W. R. Grace & Co., Columbia, Md.

Filed Feb. 22, 1980, Ser. No. 123,740
Int. Cl.³ C08F *8/32, 8/10*
U.S. Cl. 525—378 **12 Claims**

1. A process of forming polymeric polyamine/amide comprising contacting, an inert liquid solvent and, as reactants, a polymer having olefinic unsaturation distributed therein, carbon monoxide water, and a nitrogen atom containing compound selected from ammonia, a primary amine or a secondary amine at a temperature of from about 50° to 250° C. and at a pressure of from about 30 to about 300 atmospheres in the presence of a catalyst consisting essentially of a rhodium atom containing compound selected from metallic rhodium, rhodium salts, rhodium carbonyls, rhodium oxides or ligands thereof and recovering the polymeric product.

4,312,966
FLAME RETARDANT ANTISTATIC ADDITIVES AND ANTISTATIC FIBERS

David D. Newkirk, Southgate; Robert B. Login, Woodhaven, and Basil Thir, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 94,032, Nov. 13, 1979, which is a division of Ser. No. 746,723, Dec. 2, 1976, Pat. No. 4,229,554. This application Jun. 20, 1980, Ser. No. 161,729
Int. Cl.³ C08L *67/00, 77/00*
U.S. Cl. 525—425 **8 Claims**

1. A flame-retardant, antistatic synthetic polymeric fiber which is the product of the process of dispersing in said fiber about 1 percent to about 12 percent by weight of a polymer composition which is the reaction product of a polyester of a polyoxyalkylene compound having as a nucleus a nitrogen-containing reactive hydrogen containing compound with a reactant selected from the group consisting of at least one of an aliphatic or aromatic diacid, anhydride or acid halide thereof and a diol wherein at least one of said reactant is halogenated.

2. The flame-retardant antistatic fiber of claim 1 wherein said fiber is a polyamide fiber.

4,312,967
POLYMERIZATION CATALYST AND PROCESS

Donald D. Norwood, and Jackie C. Watts, both of Bartlesville, OK, assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Feb. 6, 1980, Ser. No. 118,894
Int. Cl.³ C08F *4/24, 10/02*
U.S. Cl. 526—64 **33 Claims**

1. A polymerization catalyst comprising, in combination,

(a) chromium oxide;

(b) a silica support;

(c) titanium dioxide, titanium being present in an amount within the range of about 3.0 to about 4.0 weight percent based on the weight of components a, b and c;

and

(d) an organoboron compound of the formula BR_3 wherein each R is selected independently from hydrogen, alkyl, cycloalkyl and aryl, at least one R is a hydrocarbon radi-

cal having from 1 to 12 carbon atoms, and the total number of carbon atoms in the organoboron compound does not exceed 30.

23. A polymerization process comprising contacting ethylene monomer with a first catalyst component comprising a silica support, chromium oxide at least part of which is in the hexavalent state, and titania, the amount of titanium in the first catalyst component being within the range of about 3 weight percent to about 10 weight percent based on the weight of the first catalyst component, and a second catalyst component consisting essentially of an organoboron compound of the formula BR_3 wherein each R is selected independently from hydrogen, alkyl, cycloalkyl and aryl, at least one R is a hydrocarbon radical having from 1 to 12 carbon atoms, and the total number of carbon atoms in the organoboron compound does not exceed 30 in an inert diluent at a temperature within the range of 20° to 200° C.

4,312,968
POLYMERIZATION OF OLEFINS

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 3,566, Jan. 15, 1979, Pat. No. 4,238,354. This application Jun. 16, 1980, Ser. No. 159,739
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—125 **8 Claims**

1. A process for the polymerization and/or copolymerization of alpha-olefins which comprises polymerizing or copolymerizing said olefins in the presence of a catalyst obtained by

forming a component A by mixing a milled mixture of magnesium and particulate inorganic solid selected from the group consisting of magnesium halides with an alcohol to form an unagglomerated product, the alcohol being employed in a quantity as stoichiometrically required to convert the magnesium to magnesium hydrocarbyloxide having 0–3 moles of alcohol per mole associated therewith, contacting said reaction product with a tetravalent, halogenated titanium compound and washing said titanium contacted product with an inert solvent to remove any unreacted titanium compound, and then

combining component A with a component B which is a metallic hydride or organometallic compound wherein said metal is selected from an element of Groups IA, IIA, IIIA of the Periodic Table.

4,312,969
EXOTHERM CONTROL IN POLYMERIZATION

Harold L. Becker; Rudolf S. Buriks, both of St. Louis, Mo., and James G. Dolan, Granite City, Ill., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 16, 1980, Ser. No. 140,916
Int. Cl.³ C08F *2/32*
U.S. Cl. 526—206 **7 Claims**

1. In a water-in-oil emulsion polymerization method for making polymers of water soluble ethylenic unsaturated monomers which comprises: charging a reactor with an external phase, adding the internal phase which comprises a water-soluble ethylenic unsaturated monomer and forming an emulsion with said external phase, increasing the temperature of the mixture to polymerization reaction temperature, the improvement comprising, in combination therewith, of (1) adding a low boiling inert liquid boiling below about 50° C. into said reactor prior to increasing the temperature thereof to thereby vaporize said inert liquid and (2) subsequently reflux condensing said inert fluid to thus avoid spot overheating and to dissipate reaction heat without interfering with the reaction mechanism itself.

4,312,970
SILAZANE POLYMERS FROM $\{R'_3SI\}_2NH$ AND ORGANOCHLOROSILANES

John H. Gaul, Jr., Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 20, 1981, Ser. No. 236,366
Int. Cl.³ C08F *30/08*
U.S. Cl. 526—279 **81 Claims**

1. A process of preparing an R'_3SiNH— containing silazane polymer which consists of contacting and reacting in an inert, essentially anhydrous, atmosphere, an organochlorosilane or a mixture of organochlorosilanes of the general formula

$$R_nSiCl_{4-n}$$

with a disilazane having the general formula

$$(R'_3Si)_2NH$$

at a temperature in the range of 25° C. to 300° C. while distilling by-produced volatile products, wherein

R is vinyl, an alkyl group of 1–3 carbon atoms or phenyl;

R′ is vinyl, hydrogen, an alkyl group of 1–3 carbon atoms or phenyl; and

n has a value of 1 or 2.

4,312,971
ZIRCONIUM AND MERCURY COMPOUNDS AS CO-CATALYSTS FOR THE PREPARATION OF NONCELLULAR POLYURETHANES

James A. Gallagher, Grosse Ile, and Bernardas Brizgys, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 8, 1980, Ser. No. 213,807
Int. Cl.³ C08G *18/22*
U.S. Cl. 528—56 **9 Claims**

1. A process for preparing a polyurethane comprising reacting an organic polyisocyanate with an organic compound containing a least two active hydrogen atoms as determined by the Zerewitinoff method in the presence of a catalytically effective amount of

(a) an organo-mercuric compound, and

(b) a zirconium compound selected from the group consisting of

1. zirconium tetraacetylacetonate, and

2. zirconium salts of carboxylic acids.

4,312,972
INTERPOLYMERS OF POLYURETHANES AND ADDITION POLYMERIZABLE MONOMERS

Som N. Khanna, Guelph, Canada, assignor to Uniroyal Ltd., Ontario, Canada

Filed Mar. 26, 1981, Ser. No. 247,671
Claims priority, application Canada, Nov. 17, 1980, 364789
Int. Cl.³ C08G *18/04*
U.S. Cl. 528—63 **9 Claims**

1. A homogeneous insoluble crosslinked interpolymer (A) condensation-polymerizable material and (B) free-radical-addition polymerizable material,

the said (A) being polyurethane-forming ingredients comprising:

(a) a long-chain polyether polyol having an hydroxyl number of from 25 to 115;

(b) an organic polyisocyanate having free isocyanate groups reactive with (a) to form a polyurethane; and

(c) a chain-extender or crosslinking agent for the polyurethane;

and the said (B) being free-radical addition polymerizable monomeric material which is a mixture of:

(d) a monoethylenically unsaturated monomer of the formula $R_1HC{=}CHR_2$ wherein R_1 is hydrogen or a C_1 to C_4 alkyl radical, and R_2 is phenyl, nitrile or an ester radical

where R_3 is C_1 to C_4 alkyl; and

(e) a monoethylenically unsaturated monomer having a single hydroxyl group selected from hydroxyalkyl acrylates and hydroxyalkyl methacrylates having from 1 to 4 carbon atoms in the alkyl group,

the proportions of said ingredients being, by weight,

100 parts of (a)
1 to 30 parts of (c)
10 to 200 parts of (d)
1 to 30 parts of (e), and
sufficient (b) to provide an NCO index of 1.0 to 1.1.

4,312,973

POLYURETHANE ELASTOMERS PREPARED FROM POLYOL OR POLYMER/POLYOL-CHAIN EXTENDER MIXTURES

Frank E. Critchfield, South Charleston; Richard M. Gerkin, Charleston, and Leslie E. Hawker, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 932,638, Aug. 10, 1978, Pat. No. 4,226,756, which is a division of Ser. No. 703,022, Jul. 6, 1976, Pat. No. 4,125,505. This application Apr. 11, 1980, Ser. No. 139,449
Int. Cl.³ C08G *18/62*
U.S. Cl. 528—75 **7 Claims**

1. A polyurethane elastomer produced by reacting a mixture comprising: (1) a poly(oxypropyleneoxyethylene) polyol having a hydroxyl number of from about 20 to 60, an oxyethylene cap of from about 10 to 30 weight percent and an internal oxyethylene content of from about 30 to 60 weight percent, (2) ethylene glycol, (3) an organic polyisocyanate and (4) a catalyst for the reaction of (1) and (2) with (3).

4,312,974

CURING AGENTS FOR EPOXY RESINS

Wen B. Chiao, Piscataway, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 18, 1980, Ser. No. 141,718
Int. Cl.³ C08G *59/58*
U.S. Cl. 528—114 **11 Claims**

1. A unitary, storable, heat-curable epoxy resin system, which comprises a polyepoxide and a substantially stoichiometric amount of a salt of piperazine and a C_3–C_{21} polycarboxylic acid, said salt having at least one carboxyl group per secondary amine group.

8. A process for converting a polyepoxide into an insoluble, infusible resin product, which comprises heating said polyepoxide at an elevated temperature with a substantially stoichiometric amount of a salt of piperazine and a C_3–C_{21} polycarboxylic acid, said salt having at least one carboxyl group per secondary amine group, said heating taking place at a temperature above 50° C. for a time sufficient to complete the cure.

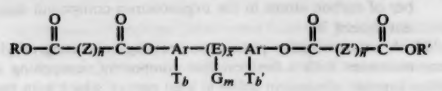
4,312,975

BISPHENOL-DICARBOXYLIC ACID DIESTER AND COMPOSITIONS THEREOF WITH LINEAR AROMATIC POLYESTER HAVING IMPROVED PROCESSABILITY

Gideon Salee, Williamsville, and Jerold C. Rosenfeld, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,447
Int. Cl.³ C08G *63/12*
U.S. Cl. 528—176 **32 Claims**

1. A diester of a bisphenol and a dicarboxylic acid having the structural formula:



wherein Ar is aromatic, G is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, haloalkylaryl, arylalkyl, haloarylalkyl, cycloalkyl or halocycloalkyl; E is a divalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene or haloarylene, —O—, —S—, —SO—, —SO_2—, —SO_3—, —CO—,

or GN<; T and T′ are independently selected from halogen, G and OG; m is an integer from 0 to the number of replaceable hydrogen atoms on E; b is an integer from 0 to the number of replaceable hydrogen atoms on Ar; x is 0 or 1; Z and Z′ are like or different groups selected from the group consisting of —Ar′— and —Ar′—Y—Ar′— where Ar′ has the same meaning as Ar; Y is an alkylene group of 1 to 10 carbon atoms, haloalkylene, —O—, —S—, —SO—, —SO_2—, —SO_3—, —CO—,

or GN<; n and n′ are independently selected from integers 0 and 1; and R and R′ are independently selected from aliphatic hydrocarbon groups of 8 to 45 carbon atoms.

4,312,976

SINGLE-STAGE MELT POLYMERIZATION PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE

Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 15, 1980, Ser. No. 169,052
Int. Cl.³ C08G *73/18*
U.S. Cl. 528—179 **48 Claims**

1. A single-stage melt polymerization process for the production of high molecular weight polybenzimidazole which comprises reacting a member of the class consisting of:

(A) a mixture of (1) at least one aromatic tetraamine containing two groups of amine substituents, said amine substituents in each group being in an ortho position relative to each other, and (2) at least one dicarboxylic acid, and

(B) at least one aromatic compound having a pair of amine-substituents in an ortho position relative to each other and a carboxylic acid group positioned upon an aromatic nucleus

at a temperature above the melting temperature of the monomeric reactant or reactants in the presence of a catalyst selected from the group consisting of organic sulfonic acids, halogenated acetic acids, and non-oxidizing inorganic acids.

4,312,977

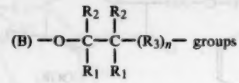
PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT OXYMETHYLENE COPOLYMER IN THE PRESENCE OF IMPURITY

Rufus S. Jones, Randolph, and Frank M. Berardinelli, Millington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,766
Int. Cl.³ C08G *2/06*
U.S. Cl. 528—241 **20 Claims**

1. A process for the production of high molecular weight oxymethylene copolymer having a predetermined comonomer content, said process compensating for the presence of impurity during the copolymerization, said oxymethylene copoly-

mer having recurring units consisting essentially of (A) —OCH_2—groups with which are interspersed



where each R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl radicals, and halogen substituted lower alkyl radicals, each R_3 is selected from the group consisting of methylene, oxymethylene, lower alkyl and haloalkyl substituted methylene, and lower alkyl and haloalkyl substituted oxymethylene radicals, and n is an integer from 0 to 3, each lower alkyl radical having 1 to 2 carbon atoms, said (A) groups constituting 85 to 99.9 percent of the recurring units, wherein said oxymethylene copolymer is formed by the reaction of formaldehyde and a comonomer in the presence of a solvent and an inorganic fluoride catalyst, said comonomer comprising at least one cyclic ether having adjacent carbon atoms and being capable of copolymerizing with formaldehyde and said solvent being selected from the group consisting of cyclopentane, cyclohexane, cycloheptane, alkyl derivatives of the foregoing wherein the alkyl groups contain up to 4 carbon atoms, and mixtures thereof, said process comprising the steps of:

(a) determining the optimal concentration of catalyst in a first oxymethylene copolymerization system containing less than approximately 10 p.p.m. of impurity containing active protons, said optimal concentration of catalyst providing high molecular weight oxymethylene copolymer product;

(b) determining the concentration of impurity in a second oxymethylene copolymerization system containing said impurity, said impurity containing at least one active proton;

(c) adjusting the concentration of said catalyst in said second oxymethylene copolymerization system so that the total concentration of said impurity and said catalyst in said second oxymethylene copolymerization system is maintained at said optimal concentration of catalyst in said first oxymethylene copolymerization system, the concentration of said impurity being no greater than approximately 70 percent of the concentration of said catalyst; and

(d) adjusting the concentration of said comonomer in said second oxymethylene copolymerization system to compensate for the adjustment in the concentration of said catalyst so as to maintain said predetermined comonomer content in said oxymethylene copolymer product.

4,312,978

PROCESS FOR THE PREPARATION OF UNSATURATED POLYESTERS ADAPTED FOR THE PRODUCTION OF UNSATURATED POLYESTER RESINS

Marzio Ligutti, and Elvio Bertotti, both of Colleferro, Italy, assignors to Snia Viscosa S.p.A., Milan, Italy

Filed Apr. 24, 1980, Ser. No. 143,419

Claims priority, application Italy, May 11, 1979, 22579 A/79

Int. Cl.³ C08G *63/66*

U.S. Cl. 528—300 **28 Claims**

1. A process for the preparation of an unsaturated polyester comprising a two stage reaction, wherein in the first stage a glycol having at least two ether bridges regularly alternated with—CH_2—CH_2—groups is reacted with either tetrahydrophthalic anhydride or tetrahydrophthalic acid to produce a product substantially free from either unreacted tetrahydrophthalic anhydride or unreacted tetrahydrophthalic acid, and subsequently, reacting in the second stage the product of the first stage with either maleic anhydride or fumaric acid.

4,312,979

POLYSACCHARIDES CONTAINING ALLOSE

Hisao Takemoto, and Tatsuo Igarashi, both of Shin-Naayo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,444

Claims priority, application Japan, Apr. 20, 1978, 53-45918; Dec. 5, 1978, 53-149715

Int. Cl.³ C07H *1/08*

U.S. Cl. 536—1 **6 Claims**

1. A polysaccharide containing allose as a constituent sugar, said polysaccharide having the following identifying characteristics:

(a) a molecular weight ranging from about 1×10^4 to about 1×10^7;

(b) no clear melting point;

(c) a content of from about 6 to about 12 mole % allose, from about 50 to about 60 mole % galactose, from about 10 to about 20 mole % glucose, from about 7 to about 14 mole % mannose and from 10 to about 12 mole % glucuronic acid;

(d) infra-red spectra showing O-H stretching in the vicinity of 3,400 cm^{-1}, C—H stretching in the vicinity of 2,890 cm^{-1} and stretching of carboxylate anions in the vicinity of 1,620 cm^{-1} due to the orientation of beta-glucosido linkages in the vicinity of 800 cm^{-1};

(e) no distinct characteristic ultraviolet absorption spectra;

(f) solubility in water but insolubility in methanol, ethanol, ethers and acetone;

(g) the following color reactions:
anthrone reaction—positive
ninhydrin reaction—negative
Dische's carbazole reaction—positive
Dische's cysteine-sulfuric acid reaction—positive;

(h) a specific rotation in water $[\alpha]_D^{25}$ of from about $+30°$ C.;

(i) forms a colorless, transparent and viscous solution with water; and,

(j) is aggregated to a gel in an aqueous solution containing calcium ion.

4,312,980

PROCESS FOR PREPARING POROUS CELLULOSE SPHERICAL PARTICLES

Yoshiaki Motozato, 1174-5, Hotakubohon-machi, Kumamoto-shi, Kumamoto-ken, Japan, and Hiroaki Ishibashi, Minamata, Japan, assignors to Chisso Corporation and Yoshiaki Motozato, both of Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,713

Claims priority, application Japan, Aug. 3, 1979, 54/98631

Int. Cl.³ C08B *3/06, 3/26*

U.S. Cl. 536—76 **9 Claims**

1. A process for preparing porous cellulose spherical particles which comprises

(a) forming a solution of cellulose triacetate in a mixed solvent that consists essentially of

(1) a chlorinated hydrocarbon and

(2) an aliphatic higher alcohol with at least six carbon atoms,

(b) suspending said solution in an aqueous medium to thereby form a plurality of droplets of said solution in said medium, said aqueous medium having a boiling point higher than said chlorinated hydrocarbon,

(c) removing the chlorinated hydrocarbon from said droplets by evaporation, and

(d) subjecting the thus obtained spherical particles of cellulose triacetate containing said aliphatic higher alcohol to saponification in order to remove said aliphatic higher alcohol from the spherical particles.

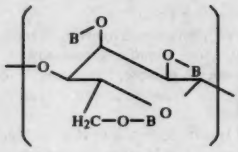
4,312,981

MODIFIED CELLULOSIC PRODUCTS HAVING ENHANCED THERMAL, SOLVENT, AND BIOLOGICAL PROPERTIES

Charles E. Carraher, Jr., Fairborn; David J. Giron, Dayton; Jack A. Schroeder, and Christy A. McNeely, both of Fairborn, all of Ohio, assignors to Wright State University, Fairborn, Ohio

Filed Apr. 1, 1980, Ser. No. 136,572
Int. Cl.³ C08B *11/00, 11/193, 15/05*
U.S. Cl. 536—84 **9 Claims**

1. A modified cellulosic composition having modified structural units:



where B is hydrogen, SnR_m or SnR_2OH, where R is C_1 to C_8 alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, and arylalkyl, and m=2 or 3, with the proviso that within a given chain of structural units all of the B groups are not hydrogen, the modified structural units being linked to each other or to unmodified cellulose structural units in the cellulosic structure.

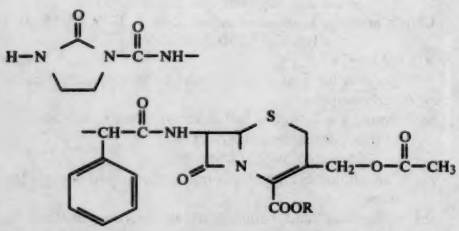
4,312,982

α-ACYLUREIDOCEPHALOSPORINS AND SALTS AND ESTERS THEREOF

George R. Fosker, Horsham, and George Burton, Coulsdon, both of England, assignors to Beecham Group Limited, England

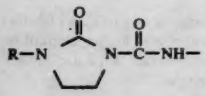
Continuation of Ser. No. 478,741, Jun. 12, 1974, abandoned. This application May 6, 1976, Ser. No. 683,792
Claims priority, application United Kingdom, Jun. 12, 1973, 27970/73; Oct. 20, 1973, 48968/73
Int. Cl.³ C07D *501/32, 501/34, 501/54, 501/56*
U.S. Cl. 542—418 **13 Claims**

1. A compound of the formula:

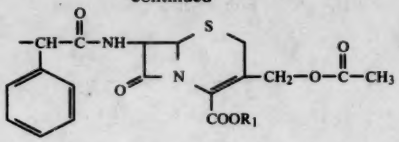


wherein R is hydrogen or sodium.

2. A compound of the formula:



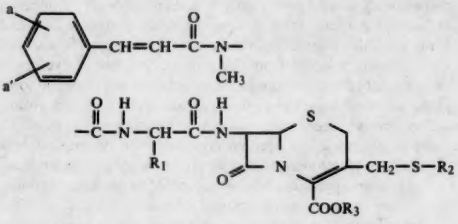
-continued



wherein R is

or CH_3SO_2— and R_1 is hydrogen or sodium.

3. The compound of the formula

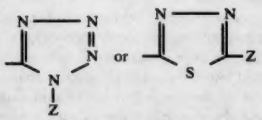


wherein

a and a' are independently hydrogen, halogen or nitro;

R_1 is phenyl, monohydroxyphenyl, mono- or dihalophenyl, monohydroxy substituted mono- or dihalophenyl or thienyl;

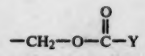
R_2 is



wherein

Z is methyl;

R_3 is hydrogen, phthalidyl or an acyloxymethyl group of the formula



wherein

Y is C_1–C_4 alkyl; and when

R_3 is hydrogen, the pharmaceutically acceptable, nontoxic salts thereof.

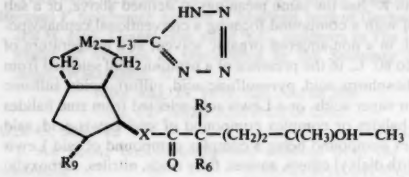
4,312,983

2-DECARBOXY-2-TETRAZOLYL-19-HYDROXY-19-METHYL-6A-CARBA-PGI$_1$ COMPOUNDS

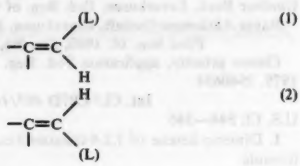
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,497
Int. Cl.³ C07D *257/04;* **A61K** *31/41*
U.S. Cl. 542—429 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein L_3 is
(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,
(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or
(3) $-CH_2-CH=CH-$;
wherein M_2 is



(1)

(2)

wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein R_9 is hydrogen or hydroxyl; and
wherein X is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$.

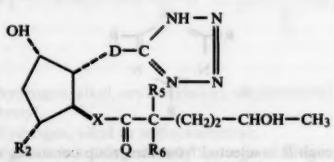
4,312,984

2-DECARBOXY-2-TETRAZOLYL-19-HYDROXY-6-OXO-PGF $_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jan. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,489
Int. Cl.^{3} C07D *257/04*; A61K *31/111*
U.S. Cl. 542—429 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein D is $-(CH_1)_2-CO-CH_2-L_2-$ or $-CH_2-CO-CH_2-L_3-$
wherein L_2 is
(1) $-(CH_2)_j$, wherein j is one to 4, inclusive,
(2) $-(CH_2)_q-CF_2-$, wherein q is one, 2, or 3, or
(3) —CH=CH—,
wherein L_3 is
(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,
(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or
(3) $-CH_2-CH=CH-$;
wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$.

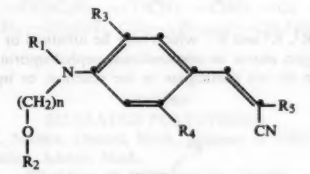
4,312,985

DISPERSE DYES FROM HETEROCYCLIC ACETONITRILES

Keith Hunt, Liverpool, England, assignor to Eastman Kodak Company, Rochester, N.Y.

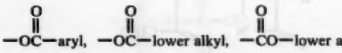
Filed Aug. 29, 1980, Ser. No. 182,732
Claims priority, application United Kingdom, May 16, 1980, 16213/80
Int. Cl.^{3} C07D *277/64, 263/54*
U.S. Cl. 542—457 **5 Claims**

1. A compound of the formula



in which R_1 is selected from hydrogen, aryl cyclohexyl, lower alkyl and lower alkyl substituted with Cl, CN, $OC_2H_4OC_2H_5$,

lower alkoxy, aryl, NHCONHPh, OCONHPh, phthalimido, succinimido, aryloxy and aryloxy substituted with one or more of Cl, Br, NO_2, CN, lower alkyl, lower alkoxy, aryl and aryloxy; R_2 is phenyl or phenyl substituted with 1–3 of lower alkyl, lower alkoxy,



—CN, —Cl or $—NO_2$; R_3 is H, Cl, lower alkyl or lower alkoxy; R_1 and R_3 combined form $—CH_2CH_2CH_2—$ unsubstituted or substituted with 1–3 methyl groups; R_4 is H, Cl, lower alkyl or lower alkoxy; R_5 is selected from 3-pyridyl, 3-benziso-thiazolyl, 2-benzothiazolyl, 2-benzoxazolyl, 2-quinoxalyl, 2-quinazolinonyl, 2-1,3,4-oxadiazolyl, 2-1,3,4-thiadiazolyl and 2-thienyl, which R_5 heterocycles are unsubstituted or substituted with Cl, Br, NO_2, CN, aryl, aryl substituted with Cl, Br, NO_2 or CN, lower alkyl, or $COOR_6$ wherein R_6 is lower alkyl or aryl; and n is 1–4.

4,312,986

PROCESS FOR PRODUCING 7-(SUBSTITUTED)AMINO-3-SUBSTITUTED THIOMETHYL-Δ^3-CEPHEM-4-CARBOXYLIC ACIDS

Isamu Saikawa; Shuntaro Takano, both of Toyama; Kaishu Momonoi, Shinminato; Isamu Takakura, Toyama; Seietsu Kuroda, Toyama; Kiyoshi Tanaka, Toyama; Kenshin Hayashi, Tonami; Bunei Nagahashi, Toyama, and Chiaki Kutani, Funabashi, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

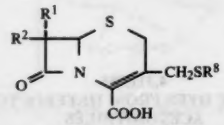
Filed Jul. 5, 1979, Ser. No. 54,917

Claims priority, application Japan, Jul. 6, 1978, 53-82377

Int. Cl.³ C07D *501/04*

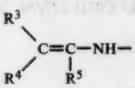
U.S. Cl. 544—26 **23 Claims**

1. A process for producing a 7-(substituted)-amino-3-substituted thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula,



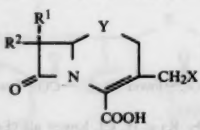
(I)

wherein R^1 is a hydrogen atom or a C_{1-4} alkyloxy group; R^2 is an amino group or a protected amino group represented by the formula,



in which R^3, R^4 and R^5, which may be identical or different, are hydrogen atoms or conventional cephalosporin substituents which do not participate in the reaction, or by the formula,

in which R^6 and R^7, which may be identical or different, are hydrogen atoms or conventional cephalosporin substituents which do not participate in the reaction; and R^8 is a moiety of a compound of the formula R^8SH, where SR^8 is a conventional 3-position cephalosporin thio substituent, or said compound (I) in which the carboxyl group is protected by a conventional cephalosporin carboxy protective group or a conventional cephalosporin salt thereof, which comprises reacting a cephalosporanic acid represented by the formula,



(II)

wherein R^1 and R^2 have the same meanings as defined above; X is carboxylic acyloxy or carbamoyloxy group or one of said groups substituted by a conventional cephalosporin substituent; >Y is >S or >S→0; or said compound (II) in which the carboxyl group is protected by a conventional cephalosporin carboxy protective group or a conventional cephalosporin salt thereof, with a thiol compound represented by the formula,

R^8—SH (III)

wherein R^8 has the same meanings as defined above, or a salt thereof with a compound forming a conventional cephalosporin salt, in a non-aqueous organic solvent at a temperature of −20° to 80° C. in the presence of a protonic acid selected from pyrophosphoric acid, pyrosulfuric acid, sulfuric acids, sulfonic acids or super acids, or a Lewis acid selected from zinc halides or tin halides or complex compound of said Lewis acid, said complex compound being a complex compound of said Lewis acid with dialkyl ethers, amines, fatty acids, nitriles, carboxylic esters or phenols.

4,312,987

DIMERIC KETENE OF 1,2,4-TRIAZOLE-3-CARBOXYLIC ACID

Gunther Beck, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

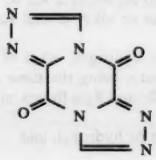
Filed Sep. 18, 1980, Ser. No. 188,427

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940654

Int. Cl.³ C07D *487/14*

U.S. Cl. 544—346 **1 Claim**

1. Dimeric ketene of 1,2,4-triazole-3-carboxylic acid, of the formula



(I)

4,312,988

SYNTHESIS OF HYDROXY FUNCTIONAL MELAMINE DERIVATIVES

William Jacobs, III, Bridgeport, and James C. Goebel, New Canaan, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

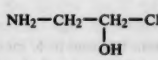
Filed Nov. 10, 1980, Ser. No. 205,119

Int. Cl.³ C07D *251/70, 251/18, 251/22*

U.S. Cl. 544—196 **4 Claims**

1. In a process for preparing hydroxy terminated melamine derivatives by reacting an alkanolamine with an amino-s-triazine compound of the formula

wherein each R is selected from the group consisting of alkyl (C_1C_{20}), cycloalkyl (C_5–C_8), aryl (C_6–C_{12}), NH_2 and NHR' wherein R' is alkyl (C_1–C_{20}), cycloalkyl (C_5–C_8) or aryl (C_6–C_{12}) and at least one R is NH_2, the improvement comprising reducing the formation of isomelamine impurities by using an alkanolamine of the formula



wherein R'' is hydrogen, alkyl (C_1–C_{20}) or phenyl.

4,312,989

PHARMACOLOGICALLY ACTIVE AMINE BORANES

Bernard F. Spielvogel; Andrew T. McPhail, both of Durham, and Iris H. Hall, Chapel Hill, all of N.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 21, 1979, Ser. No. 68,356
Int. Cl.[3] A61K *31/69;* C07F *5/02*
U.S. Cl. 546—13 7 Claims

1. An amine borane compound selected from the group consisting of $[CH_2N(CH_3)_2.BH_2COOH]_2$, $[CH_2N(CH_3)_2.BH_2CON(H)CH_2CH_3]_2$,

$(CH_3)_3N.BH_2COOCH_2CH_3$, $NCCH_2CH_2N(CH_3)_2.BH_2CN$, and $(CH_2NH_2.BH_2CN)_2$.

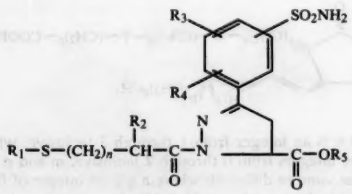
4,312,990

1-MERCAPTOACYL-3-[(AMINOSULFONYL) PHENYL]-4,5-DIHYDRO-1H-PYRAZOLE-5-CARBOXYLIC ACID

Rudiger D. Haugwitz, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 11, 1980, Ser. No. 186,110
Int. Cl.[3] C07D *231/06*
U.S. Cl. 548—379 8 Claims

1. A compound having the formula



wherein

R_1 is hydrogen, alkyl, aryl, arylalkyl, alkylcarbonyl or arylcarbonyl;

R_2 is hydrogen, alkyl or trifluoromethyl;

R_3 and R_4 each is independently hydrogen, halogen, trifluoromethyl, alkylamino, furylmethylamino, phenylamino, thienylmethylamino, alkoxy, aryloxy, benzylthio, arylthio, benzyl, benzoyl, hydroxy, cyano or arylmethoxy;

R_5 is hydrogen, alkyl or arylalkyl; and

n is 0, 1 or 2;

wherein the term "aryl" refers to phenyl or phenyl substituted with one, two or three halogen, alkyl, alkoxy, hydroxy, alkylcarbonyl, nitro, amino, alkylamino, dialkylamino, trifluoromethyl, cyano or carboxyl groups; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

4,312,991

DITHIOBENZOATE 4,5-DICYANO-1,3-(DITHIOLIDENE-2-YL)METHYLENE

Edward M. Engler, Wappingers Falls; Vishnubhai V. Patel, Yorktown Heights, both of N.Y., and Robert R. Schumaker, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1979, Ser. No. 38,050
Int. Cl.[3] C07D *339/06*
U.S. Cl. 549—39 1 Claim

1. A new composition of matter dithiobenzoate-(4,5-dicyano-1,3-dithioliden-2-yl)-methylene.

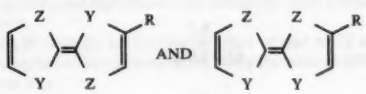
4,312,992

SUBSTITUTED HETEROFULVALENES

Dennis C. Green, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 747,136, Dec. 3, 1976, abandoned. This application Sep. 13, 1979, Ser. No. 74,927
Int. Cl.[3] C07D *339/06, 343/00, 345/00*
U.S. Cl. 549—59 15 Claims

1. Substituted tetrathiafulvalenes, tetraselenafulvalenes and dithiadiselenafulvalenes having the formulae



where Z and Y is S, Z is S and Y is Se, and Z is Se and Y is Se, and R is a substituted selected from the group consisting of: $—CO_2H$, $—CO_2C_2H_5$, $—COCH_3$, —CHO, —Cl, —Br, —I, $—CH=CH_2$ $—CO_2CH_3$, $CH_2—CH_3$ and $—CH_2OH$.

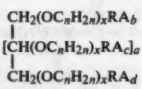
4,312,993

SILYLATED POLYETHERS

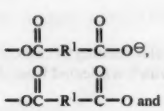
Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Sep. 10, 1979, Ser. No. 74,188
Int. Cl.[3] C07F *7/10*
U.S. Cl. 556—419 19 Claims

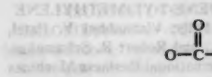
1. Silylated polyethers of the general formula



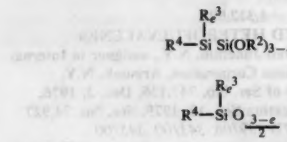
in which at least one R is selected from the group consisting of an —NH radical, an ammonium radical and a radical selected from the group consisting of



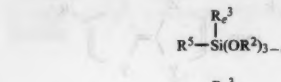
wherein the radicals are linked to the polyether through a group selected from the class consisting of an ester, amine, amide and ammonium radical and the remaining R's are selected from the group consisting of hydroxyl, hydrocarbonoxy radicals having up to 18 carbon atoms and a radical of the formula



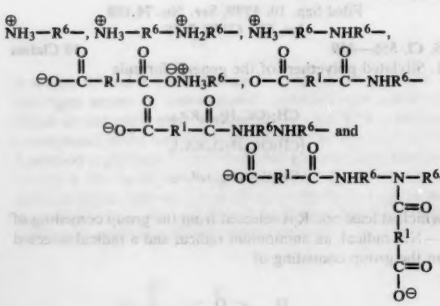
R^1 is a divalent hydrocarbon radical selected from the group consisting of $(-CH_2)_p$, $-CH=CH-$ and a cyclic radical selected from the group consisting of C_6H_4, C_6H_8 and $C_{10}H_6$; A is a silicon containing radical selected from the group consisting of cationic and anionic radicals of the formula



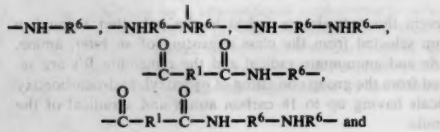
and nonionic radicals of the formula



in which R^2 and R^3 are monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, R^4 is an ionic radical linked to a silicon atom consisting of carbon, hydrogen, oxygen and nitrogen atoms which is selected from the group consisting of



R^5 is a nonionic radical consisting of carbon, hydrogen, oxygen and nitrogen atoms which is selected from the group consisting of



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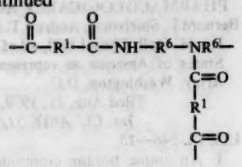
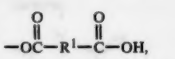


and when R is an —NH radical, R^5 may be a divalent radical, R^6 is a radical linked to a silicon atom having from 1 to 10 carbon atoms selected from the group consisting of a saturated divalent hydrocarbon radical, a divalent hydrocarbonoxy radical in which the oxygen is in the form of an ether linkage and an unsaturated divalent hydrocarbon radical, in which the unsatisfied valences are linked to a silicon atom and the unsatisfied valences of A are satisfied by R and when A is a divalent radical, the ratio of A to R is 1:2 and when R is cationic, then A must be anionic and when R is anionic, then A must be cationic and when R is nonionic, then A must be nonionic, a is a number of from 0 to 4, b, c and d are each numbers of from 0 to 1 and the sum of b, c and d must be at least 1 and when b, c or d are 0, then R is selected from the group consisting of a hydroxyl, a hydrocarbonoxy radical and a radical of the formula



e is a number of 0 to 2, n is 2, 3 or 4, x is a number of at least 1 and up to 600 and y is a number of from 0 to 8.

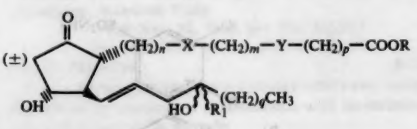
4,312,994

α CHAIN DIENIC PROSTANOIC ACID DERIVATIVES

Paul W. Collins, Deerfield, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 25, 1981, Ser. No. 247,453
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—121 **19 Claims**

1. A compound according to the formula



wherein n is an integer from 1 through 3 inclusive; wherein m+p are integers from 0 through 2 inclusive, m and p being either the same or different; wherein q is an integer of from 2 through 4 inclusive; wherein X and Y are cis or trans vinylene, X and Y being either the same or different; wherein R is:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms inclusive;

wherein R_1 is:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms inclusive;

(c) vinyl

(d) ethynyl;

(e) cyclopropyl;

(f) $—CH_2Z$;

(g) $—CH(Z)_2$; or

(h) $—CZ_3$;

wherein Z is:

(a) chlorine; or

(b) fluorine; and

wherein the (±) refers to the structure of formula I, its mirror image or the mixture of racemates; with the proviso that the

sum of n, m, and p does not exceed 3; with the proviso that y is always trans-vinylene when p equals 0.

4,312,995

COPOLYMERIZABLE ULTRAVIOLET LIGHT ABSORBER MEMBERS WHICH ARE α,β-UNSATURATED DICARBOXYLIC ACID HALF-ESTERS OF 2-HYDROXY,ALKOXY,METHYLOLBENZOPHENONES

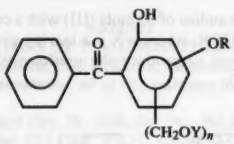
Eugene S. Barabas, Watchung; Prakash Mallya, Bloomingdale, and Stanley J. Gromelski, Jr., W. Caldwell, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 168,224

Int. Cl.³ C07C *59/84*

U.S. Cl. 560—194 **11 Claims**

1. Copolymerizable ultraviolet light absorber monomers which are α,β-unsaturated dicarboxylic acid half-esters of 2-hydroxy,alkoxymethylolbenzophenone, having the formula:



where R is alkyl C_1–C_8,

n is 1 or 2, and

Y is a half-acyl radical derived from maleic or itaconic acids.

4,312,996

BENZODIAZEPINE INTERMEDIATES

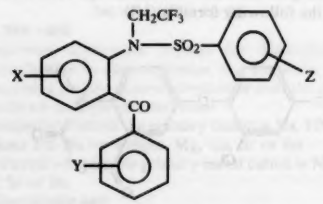
Joseph Mayer, New York, N.Y.; Lydia Peer, and Esther Babad, both of West Orange, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 29, 1980, Ser. No. 221,136

Int. Cl.³ C07C *143/822, 97/10;* C09B *11/02*

U.S. Cl. 564—92 **4 Claims**

1. A compound of the formula



wherein X and Y are independently selected from hydrogen, halogen, trifluoromethyl, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy, and Z is C_1 to C_6 alkyl or hydrogen.

4,312,997

19-HYDROXY-6-OXO-PGF$_1$ AMIDES

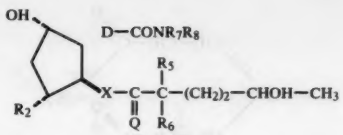
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,491

Int. Cl.³ C07C *103/19*

U.S. Cl. 564—189 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein D is $(CH_2)_2$—CO—CH_2—L_2 or —CH_2—CO—CH_2—L_3—

wherein L_2 is

(1) —$(CH_2)_j$— wherein j is one to 4, inclusive,

(2) —$(CH_2)_q$—CF_2—, wherein q is one, 2, or 3, or

(3) —CH=CH—,

wherein L_3 is

(1) —$(CH_2)_n$—, wherein n is one to 5, inclusive,

(2) —$(CH_2)_p$—CF_2—, wherein p is 2, 3, or 4, or

(3) —CH_2—CH=CH—;

wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different;

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) —CH_2CH_2—.

4,312,998

METHOD FOR MAKING N-SUBSTITUTED ACRYLAMIDES

Erich Küster, Krefeld; Bernhard Goossens, Velbert; Kurt Dahmen, Monchengladbach, and Eduard Barthell, Krefeld, all of Fed. Rep. of Germany, assignors to Chemische Fabrik, Cologne, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 145,660

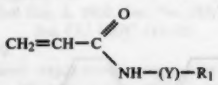
Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918486

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ C07C *102/00*

U.S. Cl. 564—205 **12 Claims**

1. A process for the preparation of an N-substituted acrylamide of the formula

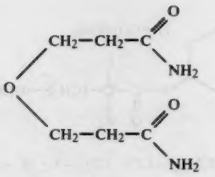


in which

Y is a divalent alkylene radical with 2 to 30 carbon atoms;

R_1 is hydrogen or a radical of the formula —$N(R_2)(R_3)$, and

R_2 and R_3 each independently is alkyl of 1 to 4 carbon atoms, comprising transamidating dihydracrylic acid amide of the formula



with an amine of the formula

$H_2N\text{-}(Y)\text{-}R_1$

thereby simultaneously eliminating ammonia and forming the corresponding amide, and splitting out water from the corresponding amide at elevated temperature.

4,312,999

GLYOXAL-POLYAMINE REACTION PRODUCTS AND PROCESS FOR THEIR PREPARATION

Theodore C. Shields, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 2,171, Jan. 9, 1979, Pat. No. 4,247,404. This application Feb. 26, 1980, Ser. No. 124,817

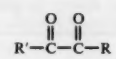
Int. Cl.[3] **C07C** *119/08, 119/12*

U.S. Cl. 564—279 **16 Claims**

1. A process for preparing water-soluble compositions comprising reacting an alkylamino substituted ethylene diamine or a homolog thereof having the structural formula:

$H[(HN(CH_2)_3]_mNHCH_2CH_2NH[(CH_2)_3NH]_nH$

with an oxalyl compound or mixture of oxalyl compounds of the structural formula:



where R and R′ are each hydrogen or an alkyl radical of 1 to 4 carbon atoms and m + n is between 2 and 6, thereby obtaining said product, the mole ratio of diamine or homolog thereof to oxalyl compound being about 2to 1, said product being water-soluble.

4,313,000

PROCESS FOR PREPARING 5-(2-CHLORO-4-TRIFLUOROMETHYLPHENOXY)-2-NITRO-N-ALKANESULPHONYL BENZAMIDES FROM A TOLUENE DERIVATIVE AND INTERMEDIATES

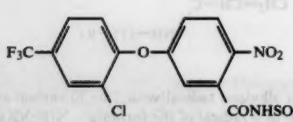
Walter M. Kruse, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 2, 1981, Ser. No. 250,204

Int. Cl.[3] **C07C** *103/76, 102/00*

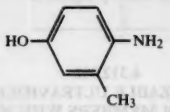
U.S. Cl. 564—99 **9 Claims**

1. A method of preparing a 5-(2-chloro-4- trifluoromethylphenoxy)-2-nitro-N-alkanesulphonyl benzamide of the following formula (I):



(I)

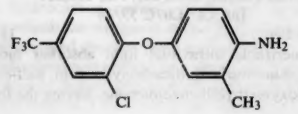
wherein R^1 is an alkyl group of about 1 to 12 carbons, from 4-amino-3-methylphenol of the following formula (II):



(II)

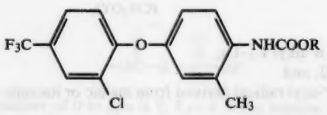
which comprises

(i) reacting the phenol of formula (II) with 3,4-dichlorobenzotrifluoride to produce the aniline of the following formula (III):



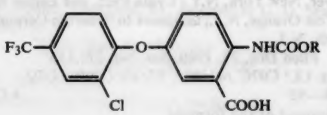
(III)

(ii) reacting the aniline of formula (III) with a compound of the formula XCOOR, wherein X is a leaving group and R is an organic moiety to produce the urethane of the following formula (IV):



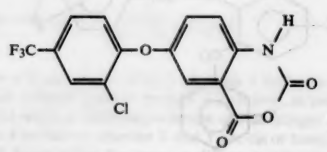
(IV)

(iii) oxidizing the urethane of formula (IV) to produce the acid of the following formula (V):



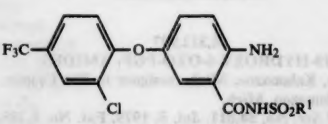
(V)

(iv) cyclizing the acid of formula (V) to produce the heterocycle of the following formula (VI):



(VI)

(v) reacting the heterocycle of formula (VI) with an alkanesulfphonamide of the formula $H_2NSO_2R^1$ to produce the sulphonamide of the following formula (VII):



(VII)

and (vi) oxidizing the sulphonamide of formula (VII) with an oxidation agent to yield the 5-(2-chloro-4-trifluoromethylphenoxy)-2-nitro-N-alkanesulphonamide of formula (I).

4,313,001

PROCESS FOR PURIFYING AQUEOUS ACRYLAMIDE SOLUTIONS

Hiroshi Itoh, Yokohama; Tadatoshi Honda, Fujisawa; Jun Saitoh, Kamakura, and Takatoshi Mitsuishi, Isehara, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,057

Claims priority, application Japan, Sep. 13, 1979, 54-116776; Jan. 28, 1980, 55-7726

Int. Cl.³ C07C *103/133*

U.S. Cl. 564—206 3 Claims

1. A process for purifying a crude aqueous acrylamide solution which has been obtained by catalytic hydration of acrylonitrile in the presence of a copper-containing catalyst, which comprises reducing unreacted acrylonitrile in said crude aqueous acrylamide solution to less than 300 ppm by distillation and then passing the thus reduced aqueous acrylamide first through a cation exchange resin layer, then through an OH-form strongly basic anion exchange resin layer, and ultimately through an H-form cation exchange resin layer.

4,313,002

PREPARATION OF P-AMINODIPHENYLAMINES

Ted Symon, Lombard; Paul R. Kurek, Schaumburg, and Michael D. Tufano, Broadview, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 29, 1980, Ser. No. 201,846

Int. Cl.³ C07C *85/11, 85/24, 85/26*

U.S. Cl. 564—423 22 Claims

1. A method of converting a p-nitrosodiphenylamine to a p-aminodiphenylamine comprising contacting a solution of an alkali metal salt of said p-nitrosodiphenylamine in a non-aqueous organic solvent with hydrogen in the presence of an effective amount of a hydrogenation catalyst under hydrogenation conditions, said solvent being a mixture of an aromatic hydrocarbon having a boiling point from about 80° to about 160° C. and a saturated aliphatic alcohol containing up to about 10 carbon atoms, and recovering said p-aminodiphenylamine.

4,313,003

PREPARATION OF DIMETHYLAMINE

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 74,419, Sep. 11, 1979, abandoned. This application Jun. 6, 1980, Ser. No. 154,482

Int. Cl.³ C07C *91/02*

U.S. Cl. 564—463 9 Claims

1. Improved continuous process for disproportionating monomethylamine to dimethylamine and ammonia, said process comprising passing monomethylamine over the crystalline aluminosilicate catalyst selected from

(a) mordenite wherein the primary cation is Na, HNa having at least 2% Na by weight, Mg, Ca, Sr or Ba

(b) ferrierite wherein the primary metal cation is Na, K, Mg, Ca, Sr or Ba

(c) clinoptilolite and

(d) phillipsite, at a temperature of 250°–475° C. and a pressure of 7–7000 KPa, at a feed rate of 0.1–10 g of monomethylamine/g of catalyst per hour, at a monomethylamine conversion of 15–75%.

4,313,004

PROCESS FOR THE REDUCTION OF DICYANOGLYCOLS

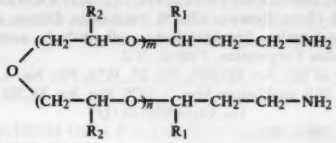
Edward W. Kluger, Pauline, and Andre M. Goineau, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 2, 1981, Ser. No. 230,938

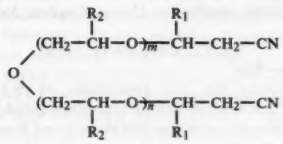
Int. Cl.³ C07C *85/12*

U.S. Cl. 564—491 11 Claims

1. A method for preparing a diaminoalkoxy



wherein m and n are both numbers from 0 to about 25 and m+n equals at least 1 R_1 is selected from H and a lower alkyl group having from 1 to about 4 carbon atoms; and R_2 is selected from H and an alkyl group containing from 1 to about 10 carbon atoms; which comprises incrementally introducing a dicyanoglycol compound of the formula:



wherein m, n, R_1 and R_2 have the values indicated above into a reaction medium at a rate sufficient to minimize cleavage reactions, at a temperature of from about 90° C. to about 160° C. in the presence of hydrogen at a pressure of from about 800 psi to about 2200 psi; ammonia in an amount of from about 10 to about 40 weight percent based on the weight of dicyanoglycol compound; and a nickel catalyst in an amount sufficient to catalyze said reaction, whereby said dicyanoglycol compound is reduced to said diaminoalkoxy compound.

4,313,005

INHIBITING AMIDINE FORMATION DURING HYDROGENATION OF ORGANO NITRILES

Michael E. Ford, Trexlertown, and Randall J. Daughenbaugh, Barto, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 3, 1980, Ser. No. 137,052

Int. Cl.³ C07C *85/12, 85/26*

U.S. Cl. 564—493 8 Claims

1. In a process for forming amines and a by-product compound having amidine linkages therein by the catalytic hydrogenation of an activated organonitrile having from 2–16 **carbon atoms in the structure, the improvement for inhibiting the formation of such compounds having amidine linkages therein which comprises including a boron compound in the hydrogenation reaction in sufficient proportion for complexing the compounds having amidine linkages therein as they are formed with boron compound.**

4,313,006

PROCESS FOR CONVERTING DIALKYL SULFIDES TO ALKYL MERCAPTANS

Robert B. Hager, Collegeville, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 3, 1980, Ser. No. 183,705

Int. Cl.³ C07C *148/00*

U.S. Cl. 568—70 13 Claims

1. A continuous vapor-phase process for preparing high purity C_1 to C_{18} alkyl mercaptan, RSH, comprising reacting dialkyl sulfide, R—S—R, where R is C_1 to C_{18} alkyl or C_6 to C_{18} cycloalkyl, with a molar excess of hydrogen sulfide in the presence of a zeolite catalyst at elevated temperatures not in excess of 390° C., said zeolite catalyst being Type X, Type Y, or Type L, and containing less than 10% by weight alkali metal, expresed as Na_2O.

4,313,007

2-HYDROXYMETHYLENECYCLOHEXANONES

Cormack Flynn, Ramsey; Glen R. Fredericks, Clifton, and Alan R. Hochstetler, Franklin Lakes, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 927,800, Jul. 25, 1978, Pat. No. 4,183,363. This application May 7, 1979, Ser. No. 36,280

Int. Cl.³ C07C *49/337*

U.S. Cl. 568—376 **4 Claims**

1. 2-Hydroxymethylene-4,4,6-trimethylcyclohexanone.

4,313,008

SYNTHESIS OF S-3-CHLORO-1,2-PROPANEDIOL

Haydn F. Jones, Reading, England, assignor to Tate & Lyle Ltd., England

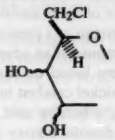
Continuation of Ser. No. 835,326, Sep. 21, 1977, abandoned. This application May 17, 1979, Ser. No. 39,894

Claims priority, application United Kingdom, Sep. 30, 1976, 40650/76

Int. Cl.³ C07C *29/14, 31/20*

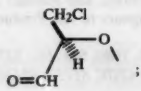
U.S. Cl. 568—844 **14 Claims**

1. A process for the production of S-3-chloro-1,2-propanediol free from R-3-chloro-1,2-propanediol, comprising reacting a chlorodeoxy-D-saccharide selected from the group consisting of chlorodeoxy-D-monosaccharides and chlorodeoxy-D-oligosaccharides containing the moiety



(I)

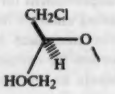
with a reagent serving to cleave the glycol grouping to provide two aldehyde groupings, to yield the corresponding derivative containing the moiety



(II)

;

reducing this derivative under mild, non-acidic conditions to the corresponding alcohol containing the moiety



(III)

and hydrolyzing said alcohol under mild acid conditions to yield S-3-chloro-1,2-propanediol.

4,313,009

PROCESS AND INSTALLATION FOR MAKING NITROPARAFFINS BY NITRATION OF HYDROCARBONS IN THE GASEOUS PHASE

Pierre Lhonore, Douai; Jacques Quibel, Maisons Laffitte, and Bernard Jacquinot, Douai, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Mar. 21, 1980, Ser. No. 132,539

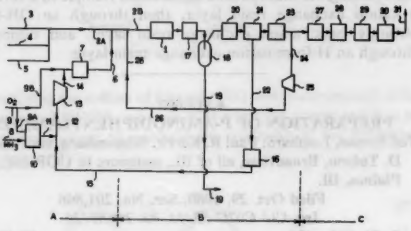
Claims priority, application France, Apr. 10, 1979, 79 08997

Int. Cl.³ C07C *76/02, 79/04*

U.S. Cl. 568—947 **12 Claims**

1. In a process for making nitroparaffins by continuous nitration in the homogeneous gaseous phase of a saturated hydrocarbon below C_5 using a nitrating agent, the improvement comprising:

continuously adding said saturated gaseous hydrocarbon and nitrating agent to a closed nitration loop under pressure containing a nitrogen reactor, a reaction-heat thermal recovery and quenching unit downstream of said reactor, a separator unit downstream of said quenching unit for extraction from the gaseous phase of a condensed liquid phase containing the nitroparaffins produced, devices downstream of said separator unit for the purification of the gaseous phase and recovery of nitrogen monoxide, means for the separation of the purified gaseous phase into a major part and a minor part, and means for recycling said major part of said purified gaseous phase as part of said closed nitration loop back to said nitration reactor at the loop pressure;



nitrating said saturated gaseous hydrocarbon in said nitrogen reactor of said closed nitration loop;

separating the reaction effluents into a gaseous phase and a liquid phase in said closed nitration loop;

purifying said gaseous phase in said closed nitration loop and recovering nitrogen monoxide therefrom;

separating said gaseous phase into a major part and a minor part, and recycling said major part of said purified gaseous phase within said closed nitration loop back to said nitration reactor at the loop pressure;

withdrawing said minor part of said gaseous phase as a continuous deconcentration purge from said closed nitration loop and recovering hydrocarbon therefrom; and

withdrawing said liquid phase from said separator unit of said closed nitration loop and recovering nitroparaffin.

4,313,010

PROCESS FOR MAKING NITROPARAFFINS BY NITRATION OF ETHANE IN THE GASEOUS PHASE

Pierre Lhonore; Bernard Jacquinot, both of Douai; Jacques Quibel, Maisons Laffitte, and Roger Mari, Villers les Nancy, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Nov. 14, 1979, Ser. No. 94,153

Claims priority, application France, Nov. 14, 1978, 78 32118

Int. Cl.³ C07C *76/02, 79/04*

U.S. Cl. 568—948 **7 Claims**

1. A process for making nitroparaffins with a high nitromethane content, comprising nitrating ethane with nitrogen peroxide in the presence of an oxidizing agent and further in the presence of an active agent selected from the group consisting of 2-nitropropane, nitroethane and a mixture thereof, with an active agent/nitrogen peroxide molar ratio in an amount sufficient to cause the reaction to become oriented toward increased nitromethane production, said ratio not exceeding 3, wherein the quantitative ratios of the reactants, the reaction contact time and the reaction temperature and pressure are so selected and controlled that the nitration is performed in a homogeneous phase as a function of the desired spectrum of nitroparaffins and within the following ranges:

ethane/nitrogen peroxide molar ratio: 12–2.5

ethane/oxidizing agent molar ratio: 12–45

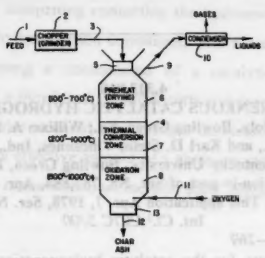
reaction contact time: 0.1–20 seconds
reaction pressure: 1–27 bars
reaction temperature: 250°–450° C.

4,313,011

PLANT HYDROCARBON RECOVERY PROCESS

Thomas A. Weil, Naperville; Peter M. Dzadzic, Lisle; Chien-Cheng J. Shih, Naperville, and Michael C. Price, West Chicago, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 9, 1980, Ser. No. 138,541
Int. Cl.³ C07C *1/00, 4/00;* C10G *1/00*
U.S. Cl. 585—240 14 Claims



1. A process using whole-plant biomass for production of fuel gases and organic liquids suitable for use as hydrocarbon fuels and as chemical feedstocks which comprises:

(a) feeding a ground or chopped whole-plant biomass of a suitable particle size to an autothermic furnace containing a heating and drying zone, a thermal conversion zone and an oxidation zone wherein said furnace is a moving bed furnace and means are provided for exclusion of oxygen-containing gases from the inlet port,

(b) heating and drying said biomass with reducing gases at a temperature within the range of from about 100° C. to 700° C.,

(c) removing said biomass from said heating and drying zone to said thermal conversion zone wherein a reducing atmosphere is present at a temperature of 200° C. to 1000° C.,

(d) exposing said biomass in thermal conversion zone to said temperature for a period of 1 second to 30 minutes,

(e) removing said biomass from thermal conversion zone to oxidation zone wherein said biomass is partially oxidized to char at a temperature of 500° C. to 1000° C. in the presence of oxygen-containing gases selected from the group consisting of molecular oxygen and air,

(f) removing said biomass from said oxidation zone wherein means are provided for exclusion of oxygen-containing gases from the outlet port,

(g) removing product gases from heat and drying zone,

(h) recovering liquid condensables from product gases.

4,313,012

PRODUCING ANTHRACENE FROM CREOSOTE

David T. Burkitt, Keyport, N.J., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 19, 1979, Ser. No. 105,054
Int. Cl.³ C10G *21/16*
U.S. Cl. 585—816 8 Claims

1. In a process for recovering anthracene as a precipitate from a creosote distillation fraction of coal tar which contains anthracene and either phenanthrene, carbazole or both, by cooling the liquid creosote distillation fraction from a first temperature at which anthracene is in the liquid phase to a second temperature at which anthracene precipitates; the improvement which comprises mixing a ketone of 3–6 carbons with the liquid creosote distillation fraction before precipitation of anthracene, in an amount of ketone sufficient to retain enough of the phenanthrene and/or carbazole in the liquid phase at the second temperature to produce a precipitate at least about 75 weight percent anthracene and enable recovery of an excess of 50 wt % of the anthracene present in said fraction.

4,313,013

PALLADIUM OR A PALLADIUM ALLOY HYDROGEN DIFFUSION MEMBRANE TREATED WITH A VOLATILE COMPOUND OF SILICON IS USED TO SEPARATE HYDROGEN FROM A MIXTURE OF IT WITH A HYDROCARBON

Jesse R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1980, Ser. No. 174,468
Int. Cl.³ C07C *7/144*
U.S. Cl. 585—818 7 Claims

1. A process for the separation of hydrogen from a mixture of it and a hydrocarbon in the presence of a palladium hydrogen diffusion membrane which comprises pretreating said membrane with a compound of silicon at an elevated temperature effective to lay down on the membrane a thin layer of silicon and then subjecting hydrocarbon to said conditions under which hydrogen is separated therefrom.

4,313,014

PROCESS FOR THE SEPARATION OF CYCLOHEXENE

Tsuneyuki Kondo, Konan; Kishio Miwa, Kamakura, and Takehisa Inoue, Tokyo, all of Japan, assignors to Toray Industries Incorporated, Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,820
Int. Cl.³ C07C *7/13*
U.S. Cl. 585—827 8 Claims

1. A process for the separation of cyclohexene comprising the steps of: contacting a feed which contains a mixture of cyclohexene and cyclohexane with a type X aluminosilicate zeolite which contains sodium cations, whereby cyclohexene is selectively adsorbed thereon, and then contacting said zeolite which adsorbed cyclohexene with at least one trimethylbenzene, whereby cyclohexene is desorbed therefrom.

4,313,015

SEPARATION PROCESS

Donald B. Broughton, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 7, 1980, Ser. No. 123,227
Int. Cl.³ C07C *7/12*
U.S. Cl. 585—828 7 Claims

1. A process for separating first, second and third components from a fluid feed stream comprising a mixture of said components, which process employs an adsorbent and desorbent material which in combination exhibit relative selectivities for said first, second and third components, respectively, in descending order of magnitude, which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said

feed input stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said desorption zone and said extract output stream at a downstream boundary of said desorption zone;

(e) passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of said first component by said adsorbent in said adsorption zone and withdrawing said raffinate output stream from said adsorption zone;

(f) passing said desorbent material into said desorption zone at desorption conditions to effect the displacement of said first component from the adsorbent in said desorption zone;

(g) withdrawing said extract stream comprising said first component and desorbent material from said desorption zone;

(h) withdrawing said raffinate output stream comprising a stream of substantially pure third component and desorbent material from said adsorption zone at said downstream boundary thereof;

(i) withdrawing an intermediate raffinate stream comprising a mixture of said second component, said third component and desorbent material from said adsorption zone in an amount sufficient to provide said substantially pure third component raffinate stream in admixture with said desorbent material withdrawn in (h), said intermediate raffinate stream being withdrawn at a locus approximately midway between the upstream and downstream boundaries of said adsorption zone; and

(j) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, extract output stream and the intermediate raffinate output stream to effect the shifting of zones through said adsorbent and the production of extract output, raffinate output and intermediate raffinate output streams.

4,313,016

ISOBUTENE REMOVAL FROM C4 STREAMS

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Oct. 23, 1980, Ser. No. 199,842

Int. Cl.³ C07C *7/148, 7/177, 2/04*

U.S. Cl. 585—832 **11 Claims**

1. A process for removing isobutene from a feed stream comprising predominately C_4 hydrocarbons and containing isobutene and n-butene, said isobutene being present in an amount of from about 0.5 to 5 mole percent comprising:

(a) contacting said feed stream in liquid phase with a fixed bed of sulfonic acid group containing cation exchange resin in a reactor at a temperature of from 50° to 80° C., said feed stream being fed at a rate of a liquid hourly space velocity from about 2.5 to 12,

(b) reacting the isobutene to form oligomers thereof having number average weight of C_{16} hydrocarbons or less to form a product stream comprising said C_4 hydrocarbons and oligomers and having less than 0.2 vol. % isobutene therein, and

(c) removing said product stream from said reactor.

4,313,017

SELECTIVE HYDROGENATION OF POLYNUCLEAR AROMATIC REACTANTS

Roger N. McGinnis; Lloyd E. Gardner, and Floyd Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Continuation of Ser. No. 118,834, Feb. 5, 1980, abandoned. This application Dec. 29, 1980, Ser. No. 221,121

Int. Cl.³ C07C *5/10*

U.S. Cl. 585—266 **29 Claims**

1. A process comprising:

contacting a polynuclear aromatic reactant with a zinc titanate catalyst under conditions to selectively hydrogenate the polynuclear aromatic reactant.

4,313,018

HETEROGENEOUS CATALYTIC HYDROGENATION

Norman L. Holy, Bowling Green, Ky.; William A. Logan, Nashville, Tenn., and Karl D. Stein, Vincennes, Ind., assignors to Western Kentucky University, Bowling Green, Ky.

Continuation-in-part of Ser. No. 787,584, Apr. 14, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,244

Int. Cl.³ C07C *5/00*

U.S. Cl. 585—269 **11 Claims**

1. A process for the catalytic hydrogenation of organic compounds which comprises reacting said compounds with hydrogen in the presence of a heterogeneous catalyst consisting essentially of anthranilic acid complexed with a member selected from the group consisting of rhodium, ruthenium, palladium and platinum, said anthranilic acid complex being chemically linked through the amino group thereof to a polymeric support having reactive sites thereon for effecting the chemical linkage between the anthranilic acid complex and said polymer.

4,313,019

METHOD FOR PRODUCING LOW MOLECULAR WEIGHT POLYMER

Hajime Hara, Fujisawa; Atsushi Kaiya, and Yoshihiko Araki, both of Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Dec. 2, 1977, Ser. No. 856,638

Claims priority, application Japan, Dec. 6, 1976, 51-146345; Dec. 7, 1976, 51-146208

Int. Cl.³ C07C *11/02*

U.S. Cl. 585—429 **8 Claims**

1. In a method for producing a low molecular weight polymer or copolymer by introducing a polymerization initiator consisting of metallic sodium or an organic sodium compound, an alkyl aryl compound as a chain transfer agent, an inert hydrocarbon as a solvent and a conjugated diolefin, mixture of conjugated diolefins or both a conjugated diolefin and a vinyl compound having anionic copolymerization activity with diolefin as a monomer or monomers into a polymerization vessel and polymerizing or copolymerizing therein successively at a temperature of 0° to 100° C., said alkyl aryl compound being represented by the general formula: $Ar—CR_1R_2H$ in which the symbol Ar is an aryl group and each of R_1 and R_2 is a hydrogen atom or an alkyl group having 1 to 20 carbon atoms, to produce a low molecular weight polymer or copolymer having a number average molecular weight of 300 to 10,000, the improvement which comprises employing 0.05 to 2 mole % per 1 mole of said polymerization initiator of oxygen in the polymerization whereby the polymerization can be carried out on a large scale with good reproducibility.

4,313,020

HYDROCARBON DEHYDROGENATION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des. Plaines, Ill.

Continuation-in-part of Ser. No. 57,623, Jul. 16, 1979, Pat. No. 4,250,020, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Nov. 24, 1980, Ser. No. 209,551

Int. Cl.[3] C07C *5/41, 4/02*

U.S. Cl. 585—434 28 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at hydrocarbon dehydrogenation conditions, with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state, and of a germanium component.

4,313,021

PROCESS FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Ji-Yong Ryu, Ramsey, N.J., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 28,015, Apr. 6, 1979, Pat. No. 4,243,827. This application Oct. 6, 1980, Ser. No. 194,154

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.[3] C07C *2/70*

U.S. Cl. 585—470 13 Claims

1. A process for the catalytic conversion of an aromatic hydrocarbon comprising contacting the aromatic hydrocarbon in the presence of a catalyst which is prepared by:

(a) impregnating alumina with a complex of anhydrous titanium fluoride and an organic compound containing at least one methoxy group per molecule or an organic compound having at least one electron donor atom and double bond per molecule; and

(b) heat treating the resulting impregnated alumina in an inert atmosphere.

9. The process of claim 1 wherein the catalytic conversion is isomerization of an alkyl aromatic compound.

11. The process of claim 1 wherein the catalytic conversion is transalkylation of alkyl aromatic compounds.

4,313,022

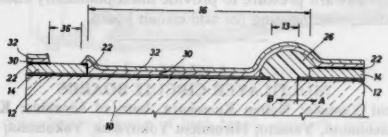
SOLAR CELL ARRAY

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Continuation-in-part of Ser. No. 945,312, Sep. 25, 1978, Pat. No. 4,243,432, which is a division of Ser. No. 831,544, Sep. 8, 1977, abandoned. This application Sep. 22, 1980, Ser. No. 189,131

Int. Cl.[3] H01L *31/06, 31/18*

U.S. Cl. 136—244 10 Claims



1. A process for forming a series-connected backwall array of photovoltaic cells on a common transparent vitreous substrate, wherein the photovoltaic cell component layers include a transparent electrically conductive layer adjacent said substrate, a semiconductor layer adjacent said transparent conductive layer, a material forming a heterojunction with the semiconductor material, and an upper conductive layer contacting said heterojunction-forming material and wherein said transparent conductive layer and said semiconductor layer are initially formed as substantially continuous layers over said substrate, the process improvement comprising the steps of:

selectively removing portions of said transparent conductive layer and said semiconductor layer to form a plurality of paired adjacent cell areas including an interconnection region associated with and between each said pair of adjacent cell areas, said interconnection region defining an isolation gap where said transparent conductive layer and said semiconductor layer are removed and an electrode connection area where said semiconductor layer is removed from a portion of one said pairs of adjacent cell areas to expose said transparent conductive layer adjacent said isolation gap;

depositing an insulating material filling said isolation gap and extending to said semiconductor layer of the other of said pairs of cell areas;

depositing a strippable material onto said semiconductor layer of each said cell area adjacent its associated electrode connection area;

thereafter forming a heterojunction on exposed areas of said semiconductor layer;

depositing a substantially continuous upper electrically conductive layer over said plurality of cell areas and in physical and electrical contact with said exposed transparent conductive layer; and

thereafter removing said strippable material to segment said upper conductive layer for obtaining said series-connected array.

6. A series-connected backwall array of photovoltaic cells on a common transparent vitreous substrate, wherein the photovoltaic cell component layers include a transparent electrically conductive layer adjacent said substrate, a semiconductor layer adjacent said transparent conductive layer, a material forming a heterojunction with the semiconductor material, and an upper electrode structure having a first portion defining a continuous surface over a heterojunction area on one cell and a second portion extending to physical and electrical contact with said transparent conductive layer of an adjacent cell, wherein the improvement comprises:

an edge of said second electrode portion of one said photovoltaic cell being in facing relationship with an edge of said first upper electrode portion of an adjacent photovoltaic cell,

said edges defining a separation zone on said semiconductor layer substantialy free of said heterojunction.

4,313,023

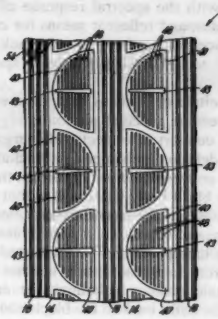
SOLAR CELL MODULE

Richard B. Stephens, Murray Hill, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 15,931, Feb. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,795, Jun. 30, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,727

Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—246 11 Claims



1. A solar cell module comprising:

a support structure having at least one planar surface adapted to support an array of solar cells;

a plurality of solar cells each having a top and a bottom surface arrayed in linear strips on said support structure, said solar cells being selected from semicircular, square and ribbon solar cells;

linear land areas between said linear arrayed solar cells;

a light transparent optical medium optically coupling said solar cells and said land areas;

a plurality of V-shaped grooves on said linear land areas with light reflective surfaces thereon, said grooves extending linearly and for the length of said linear strips of cells, whereby said module can be positioned in use with said grooves running in an east-west direction, each groove having a predetermined angular relationship with respect to the planar surface of said support and each other so that light impinging on said reflective surfaces of said groove is reflected upwards through said optical medium and forms an angle at the top surface thereof which is greater than the critical angle whereby said reflected light is internally reflected downwardly toward said solar cells.

4,313,024

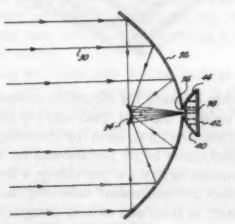
CONVERSION OF SOLAR TO ELECTRICAL ENERGY

William E. Horne, 17266 NE. 18th Pl., Bellevue, Wash. 98005

Filed Apr. 5, 1977, Ser. No. 784,943

Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—253 3 Claims



1. A sun powered generator comprising:

photovoltaic cell means;

means for changing the spectral characteristics of sun rays to better match the response function of said photovoltaic cells means, so that more of the photon energy absorbed by the photovoltaic cell means is used to generate electricity and less of such absorbed photon energy merely heats the photovoltaic cell means, comprising:

a black body which when heated will radiate a black body spectrum of photon energy having a good spectral match with the spectral response of the photovoltaic cell means; and reflector means for collecting sun rays and concentrating them on said black body, to heat and cause it to radiate a black body spectrum of photon energy;

said photovoltaic cell means being spaced from said black body to receive radiated photon energy from said black body and convert it to electrical energy;

wall means defining a chamber and including a window for receiving concentrated sun rays from the reflector means;

wherein the black body is located within said chamber and the photovoltaic cell means are mounted in said chamber;

reflecting means behind said photovoltaic cell means for reflecting that portion of the radiated energy which is emitted from said black body but not absorbed by said photovoltaic means, including that energy transmitted through the cells, back to the black body to help maintain its temperature;

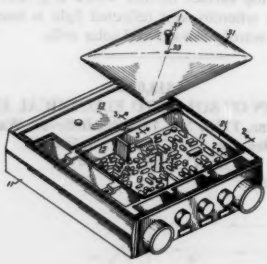
said wall means including a generally parabolic portion having a window at its apex for receiving concentrated sun rays from the reflector means, and a wall portion opposite the apex on which the photovoltaic cell means are mounted, with the generally parabolic portion of the wall means having a mirrored inner surface, and with said black body being located generally at the focus of the mirror surface, so that radiant energy from the black body received by the mirror surface will be reflected by it to the photovoltaic cell means.

4,313,025

UNITARY DIE-CAST ASSEMBLY FOR ELECTRONIC CIRCUITS

Franklin F. Grube, Jr., West Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1980, Ser. No. 156,296
Int. Cl.³ H05K *5/04*
U.S. Cl. 174—50 **1 Claim**



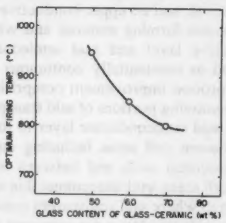
1. An assembly housing for electronic circuits, the assembly comprising a unitary die-cast, said unitary die-cast having at least a pair of compartments, each for receiving a circuit board, the two compartments being partitioned by a wall, said wall having a channeled cavity for providing a thermal separation between the two compartments whereby said wall acts as a thermal insulator, at least one of said compartments forming a housing with a cavity for receiving a circuit board therein, said housing being made of a rigid and a highly acoustically dampening material, a cover adapted to cover said housing and enclose the cavity, said cover being a rigid but flexible material, and means for forcibly fastening the cover to the housing through an aperture situated substantially at the center thereof, said fastening means comprising a center tap post positioned substantially in the center of the cavity, said post being an integral part of the die-cast, and a threaded screw adapted to fasten said cover forcibly onto the housing through a tap in the center of the cover so that the force applied to the cover by the tightened screw applies pressure onto the cover whereby the pressure applied to the cover causes the cover to apply lateral and downward pressure to provide microphonically enclosed and dampened housing for said circuit board.

4,313,026

MULTILAYER CIRCUIT BOARDS

Seiichi Yamada; Nobuo Kamehara, both of Machida; Kaoru Hashimoto, Yamato; Hiromitsu Yokoyama, Yokohama; Koichi Niwa, Tama, and Kyohei Murakawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 26, 1979, Ser. No. 88,467
Claims priority, application Japan, Nov. 8, 1978, 53-137710
Int. Cl.³ H05K *1/03*
U.S. Cl. 174—68.5 **13 Claims**



1. A multilayer circuit board comprising a first multilayer circuit including at least a ground conductor and an insulator surrounding said ground conductor, a second multilayer circuit including a plurality of signal conductors and an insulator surrounding said signal conductors, a central insulating layer between said first and said second multilayer circuits of a material having a larger thermal conductivity and a higher dielectric constant than those of said insulator of said first and second multilayer circuits, said insulator of said first and second multilayer circuits comprising a glass-ceramic comprising a mixture of at least approximately 50% by weight of borosilicate glass in alumina, said glass-ceramic having sufficient density as to be non-water absorbing, and said central insulating layer comprising a sintered plate of alumina having a purity of at least 90% and a density of at least 90%.

4,313,027

ASSEMBLY FOR FIXING AN UNDERSEA CABLE TO THE HOUSING OF A REPEATER AND A METHOD OF MANUFACTURING SAID ASSEMBLY

Jean-Patrick Vives, Calais, France, assignor to Les Cables de Lyon, Lyon Cedex, France

Filed May 9, 1980, Ser. No. 148,354
Claims priority, application France, May 10, 1979, 79 11855
Int. Cl.³ H02G *15/14*
U.S. Cl. 174—70 S **14 Claims**

1. An assembly fixing an undersea telecommunications cable having a central strength member but no metal armouring to the housing of a repeater, the assembly including:

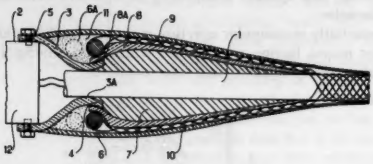
a funnel-shaped conical part having a flared mouth piece extending from a neck whose inside diameter is substantially equal to the outside diameter of the cable;

means fixing said conical part to the housing of the repeater;

an elongate elastomer sleeve which surrounds the end of the cable up to the neck of said conical part and whose outside

diameter tapers gradually towards its end remote from said mouth piece;

an elongate shell made of stratified material comprising glass fibres and settable resin, said fibres surrounding the flared mouth piece of the conical part and said sleeve;



an outer braided sleeve of high tensile strength, said outer sleeve extending around the periphery of said elongate shell;

and an elastomer cover surrounding the aforementioned parts and being fixed at one end to the housing of the repeater and extending to the furthest end of the braided outer sleeve from the housing of the repeater.

4,313,028

CABLE TERMINATION SECUREMENT

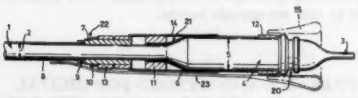
Ronald C. Oldham, Chandlers Ford, and Peter Worthington, Southampton, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,384

Claims priority, application United Kingdom, Feb. 27, 1979, 06839/79

Int. Cl.³ H02G *15/14*

U.S. Cl. 174—70 S **8 Claims**



1. A termination between a cable having a tensile strength member, and a structure, wherein anchor wires secured to the structure are applied over a predetermined length of the cable adjacent thereto to grip the cable and transfer the tensile load on the cable to the structure, and wherein means are provided to reduce the grip of the wires relative to the cable over an initial portion of the predetermined length adjacent the structure so as to minimise if not eliminate damage to the cable during tensile load transfer and minimise if not eliminate tensile load transfer to the initial portion.

4,313,029

SHIELDED MINING CABLE

Stephen Bunish, Marion, Ind., assignor to The Anaconda Company, Greenwich, Conn.

Filed Oct. 1, 1979, Ser. No. 80,309

Int. Cl.³ H01B *7/08*

U.S. Cl. 174—115 **4 Claims**

1. An electrical power cable comprising

(a) a core of flattened, substantially elliptical shape having a major axis and a minor axis normal thereto including

(1) a plurality of three power conductors,

(2) a ground check conductor,

(3) a ground conductor, and

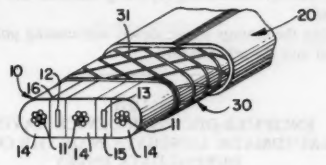
(4) plural bodies of elastomeric material and each said conductor disposed in a separate body wherein

(i) said bodies supporting each said power conductor and ground check conductor is an insulating material,

(ii) said body supporting said ground conductor comprising a bedding jacket of semi-conductive material forming part of a current path to ground,

(iii) each said body of elastomeric material arranged along said major axis, and

(iv) one of said ground conductor and ground check conductor located between a first pair of power conductor and the other of said ground conductor and ground check conductor located between the other pair of power conductor bodies;



(b) a jacket surrounding said core, said jacket being formed of an insulative material; and

(c) a continuous layer of a semi-conducting material substantially of equal thickness throughout disposed around and in contact with said core thereby to provide an additional part of said current path to ground in the event of the occurrence of physical damage to said electrical power cable.

4,313,030

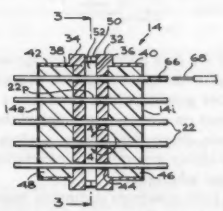
ELECTRICAL PENETRATION APPARATUS AND METHOD OF MAKING SAME

Dieter G. Bosch, Simi Valley, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 26, 1979, Ser. No. 15,853

Int. Cl.³ H01B *17/26*; G21C *13/02*

U.S. Cl. 174—151 **7 Claims**



6. An electrical penetration apparatus comprising:

a first cup-shaped casing including a base wall defining a plurality of holes therein extending from a first to a second surface thereof and a sidewall projecting from said first surface of said base wall and surrounding a volume defining a first cavity;

a second cup-shaped casing including a base wall defining a plurality of holes therein extending from a first to a second surface thereof and a sidewall projecting from said first surface of said base wall and surrounding a volume defining a second cavity;

means mounting said first and second casings proximate to one another with their respective base wall second surfaces opposed to but spaced from one another, said mounting means including at least one electrical conductor extending through holes in said first and second casings and through and beyond said first and second cavities;

said first cavity including potting material therein adhered to said at least one electrical conductor and said base wall and side wall of said first casing;

said second cavity including potting material therein adhered to said at least one electrical conductor and said base wall and side wall of said second casing.

7. A method for constructing an electrical penetration module, comprising:

holding a pair of cup-shaped casings which each have at least one hole in its base wall, so their base walls lie opposite one another and their side walls extend away from one another;

projecting an electrical conductor through said holes in said base walls;

holding the casings so the cup opening of a first one faces upwardly, and casting a potting material into the casing; and

turning the casings upside down, and casting potting material into the other casing.

4,313,031

ENCIPHER-DECIPHER DEVICE HAVING SEMI-AUTOMATIC GENERATION OF THE CODE KEY DURING DATA ENTRY

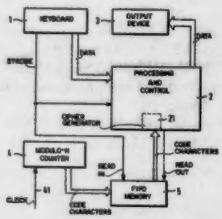
Walter R. Widmer, Niederhasli, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Oct. 23, 1979, Ser. No. 87,633

Claims priority, application Switzerland, Oct. 27, 1978, 11121/78

Int. Cl.³ H04L *9/00*

U.S. Cl. 178—22.17 **14 Claims**



1. Apparatus for data encryption comprising an input keyboard, an encipher-decipher stage for processing data which includes a cipher generator that produces a cipher pulse sequence dependent on a code item supplied thereto in the form of a set of code characters, and a random code generator coupled to said cipher generator for generating said code item, the improvement wherein:

said random code generator comprises means for generating code characters and a store coupled thereto for holding a set of code characters; and

said keyboard having an output coupled to the random code generator to control same and cause a random code character to be entered in the store on each actuation of any random key in at least a group of the keys of the keyboard.

4,313,032

FOLDED HORN LOUDSPEAKER SYSTEM

Donald W. Thomas, and Stephen A. Stockton, both of Little Rock, Ark., assignors to Invironments Inc., Little Rock, Ark.

Filed May 18, 1979, Ser. No. 40,447

Int. Cl.³ H04R *1/30*

U.S. Cl. 179—1 E **2 Claims**

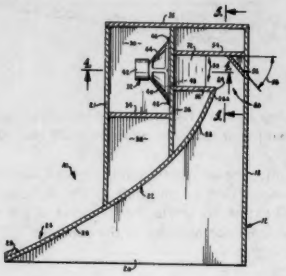
1. A folded horn loudspeaker system comprising:

rigid enclosure means comprising a substantially planar top, a substantially planar bottom spaced apart from said top, and a planar side extending between said top and said bottom and generally perpendicular with respect thereto;

flared horn means terminating in an open mouth for projecting sound from said enclosure means, said horn means defined between said planar side and a substantially exponentially-curved, rigid surface originating within said enclosure means and extending perpendicularly between said top and said bottom, said flared horn means including a throat positioned interiorly of said enclosure means;

substantially sealed chamber means defined interiorly of said enclosure means spaced apart from said horn means throat and including speaker transducer means for generating sound, said speaker comprising an aperture cone having a diameter;

substantially rectangular aperture means defined in said chamber means having an aperture width, and having a length substantially equal to said cone diameter;



waveguide means defined within said enclosure means substantially perpendicular to said side and said chamber means for conducting sound from said aperture means to said throat, said waveguide means having a width substantially equal to said aperture width; and

planar baffle plate means for deflecting sound waves from said waveguide means into said horn means throat, said baffle plate means extending between said top and said bottom and between said waveguide means and said first side, said baffle means forming an angle of substantially forty degrees with respect to said waveguide means.

4,313,033

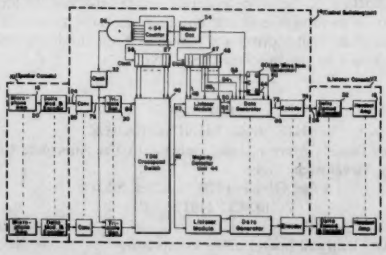
APPARATUS AND METHOD FOR DIGITAL COMBINATION OF DELTA MODULATED DATA

Donald F. Walker, Anaheim, and Robert G. Phelps, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 892,353, May 31, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 114,138

Int. Cl.³ H03K *13/22*; H04J *3/04*; H04M *3/56*; H04Q *11/04*

U.S. Cl. 179—1 H **10 Claims**



1. An intercom system to process delta modulated sound data as digital bits, comprising in combination:

(a) a plurality of speaker stations, each of which transforms sound into encoded bipolar delta modulated data having bit rate R;

(b) a plurality of listener stations, each of which accepts encoded delta modulated data and transforms said data into sound; and

(c) a central switching unit of a plurality of receiver means for accepting said encoded bipolar delta modulated data and transforming said bipolar delta modulated data to a tri-state stream of digital data wherein the "one" state of the stream indicates consecutive "ones", the "zero" state of the stream indicates consecutive "zeros", and the "off" state of the stream indicates alternating "ones" and "zeros" of said encoded bipolar delta modulated data, wherein said central switching unit accepts said encoded delta modulated data from said plurality of speaker stations and digitally combines the data of selected speaker stations for one or more of said listener stations so that the combined encoded delta modulated data has a bit rate R identical to that of said encoded bipolar delta modulated data of said speaker stations.

4,313,034
CONNECTING CIRCUIT FOR A TELEPHONE LINE

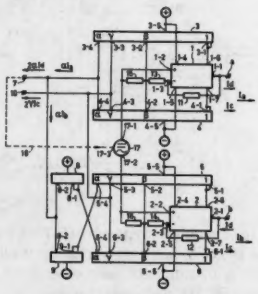
Aloysius J. Nijman, and Franciscus A. C. M. Schoofs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,306

Claims priority, application Netherlands, May 10, 1979, 7903665

Int. Cl.³ H04M *3/02*; H04B *3/36*

U.S. Cl. 179—16 F **6 Claims**



1. A connecting circuit for a telephone line comprising a pair of amplifiers whose outputs are connected to one and to the other wire, respectively, of the telephone line and whose positive and negative supply terminals are connected to the corresponding terminals of a supply source, characterized in that four current detection circuits each having a linear transfer characteristic, are respectively connected into the four connections between the supply terminals of the amplifiers and the supply source and that means are provided for combining the output signals of the current detection circuits connected in the supply leads of a same amplifier for forming output signals which are linearly dependent on the currents in the wires of the telephone line irrespective of whether or not the longitudinal currents exceed the loop currents.

4,313,035
METHOD OF PROVIDING PERSON LOCATOR SERVICE

David S. Jordan, Aberdeen, and Roy P. Weber, Bridgewater, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

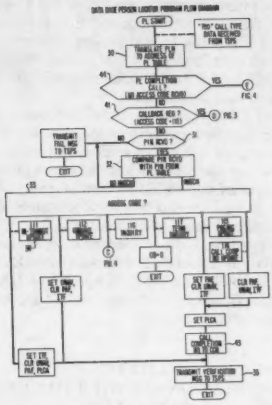
Filed Jan. 18, 1980, Ser. No. 113,383

Int. Cl.³ H04M *3/42, 7/06, 15/16*; H04Q *3/70*

U.S. Cl. 179—18 BE **31 Claims**

1. A method of providing person locator service in a telephone system comprising a plurality of stations, a plurality of telephone offices, a centralized data base, and a data communications network interconnecting said data base and said offices, said method being characterized by the steps of

under direct control of a telephone subscriber, storing at said data base information specifying: person locator service active status for said subscriber for telephone call completion, a call completion number for completing calls to said subscriber if the subscriber is available for call completion, and in-transit status of said subscriber if said subscriber is unavailable for receiving a call,



responsive to a call from a first one of the stations to said subscriber and received at a first one of said offices, addressing said data base to examine the stored information,

responsive to the receipt of the call completion number from said data base indicating that said subscriber is available for call completion, completing the call from said first office to the call completion number, and

responsive to a receipt of in-transit status information, supplying an in-transit signal to said first one of said stations.

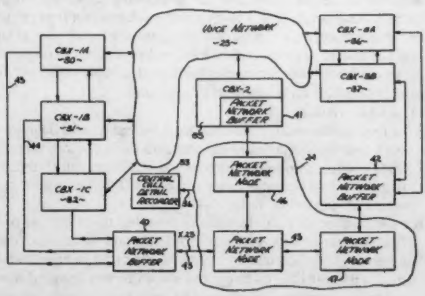
4,313,036
DISTRIBUTED CBX SYSTEM EMPLOYING PACKET NETWORK

Michael D. Jabara, San Francisco; Charles H. Jolissaint, Sunnyvale; David Lieberman, Palo Alto, and John D. Edwards, Campbell, all of Calif., assignors to Rolm Corporation, Santa Clara, Calif.

Filed Feb. 19, 1980, Ser. No. 122,415

Int. Cl.³ H04M *7/06*

U.S. Cl. 179—18 AD **13 Claims**



1. A distributed, computerized branch exchange (CBX)

system for providing a virtual network between remotely located CBXs, comprising:

at least a first and a second CBX, said first and second CBX being coupled to a voice network for the establishing of calls between said CBXs;

said first CBX including recognition means for recognizing the number of a called station associated with said second CBX, requested by a call initiated at said first CBX, and first data means for preparing a first digital packetized message representative of said number of said called station;

a first line interconnecting said first CBX with a packet network for communicating said first packetized message from said first CBX to said packet network;

a second line interconnecting said packet network with said second CBX for communicating said first packetized message to said second CBX;

said second CBX including status determining means for receiving said first packetized message and for determining the status of said called station, and second data means for preparing a second packetized message representative of the status of said called station, said second data means coupled to said second line for communicating said second message to said packet network;

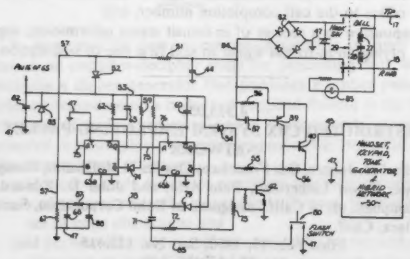
whereby said first CBX is informed of the status of said called station associated with said second CBX which may be remotely located from said first CBX before initiating a call from said first CBX to said second CBX over said voice network.

4,313,037

TELEPHONE STATION SET WITH IMPROVED FLASH SIGNALLING

Robert R. Shepard, Fremont, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Jun. 2, 1980, Ser. No. 155,109
Int. Cl.³ H04M 1/00
U.S. Cl. 179—81 R **3 Claims**



1. In a telephone station set coupled to a switching system adapted to detect when said set is drawing a certain range of current, said set having a hook switch which, in a first position, corresponding to an off-hook condition, electrically couples said set to said system, and in a second position, corresponding to an on-hook condition, electrically decouples said set from said system, an improvement comprising:

(a) a flash switch;

(b) a first multivibrator electrically coupled to said flash switch such that upon manually closing said flash switch, when said hook switch is in said first position, said first multivibrator is triggered and remains in its triggered state for a first predetermined period of time;

(c) a transistor switch electrically coupled to an output of said first multivibrator and said system, said transistor switch adapted to substantially cease conducting while said first multivibrator is in its triggered state thereby causing said set to draw a current less than said certain range of current;

(d) a second multivibrator with an input coupled to said hook switch and an output electrically coupled to said first multivibrator, such that upon a change from said off-hook condition to said on-hook condition, said second multivibrator is triggered and remains in its triggered state for a predetermined second period of time, said first multivibrator adapted to remain in its triggered state for a period of time equal to approximately the time said second multivibrator is in its triggered state plus said first predetermined period of time;

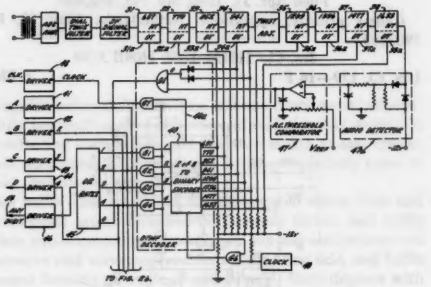
whereby two distinct conditions may be detected by said system by sensing the duration of current flow within said certain range of current which is drawn by said set.

4,313,038

DTMF SIGNAL RECEIVER

Albert G. Nilssen, Cupertino, and Spencer L. Hermanson, Mountain View, both of Calif., assignors to Wescom, Inc., Downers Grove, Ill.

Division of Ser. No. 951,516, Oct. 13, 1978, Pat. No. 4,219,699.
This application Feb. 19, 1980, Ser. No. 122,563
Int. Cl.³ H04M 1/50
U.S. Cl. 179—84 VF **3 Claims**



1. A dual tone multiple frequency (DTMF) signal receiver for telephone systems, said receiver comprising

an amplifier with automatic gain control for receiving and amplifying DTMF and audio signals,

a series of bandpass and notch filters receiving the output from said amplifier for producing bandpass and notch outputs in response to the DTMF frequencies, the first filter in said series receiving the output from said amplifier and each succeeding filter in said series receiving the notch output of the preceding filter with each filter being tuned to a prescribed DTMF frequency so that the notch outputs of said filters successively eliminate signals with the prescribed DTMF frequencies, the bandpass output of each of said filters including only the particular DTMF frequency to which that filter is tuned,

a plurality of detection means each receiving the bandpass output from one of said filters for producing signals representing the presence or absence of a signal of each prescribed DTMF frequency in the output from said amplifier,

a DTMF decoder receiving the signals from said detection means and producing output signals in response to the simultaneous detection of preselected pairs of the prescribed DTMF frequencies,

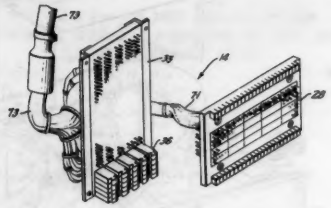
A voice guard circuit receiving the notch output from the last filter in said series and comparing the amplitude of that notch output with a predetermined threshold level for producing a disable signal whenever the amplitude of said notch output is greater than said predetermined threshold level, said disable signal being supplied to said DTMF decoder for disabling the production of said output signals by said decoder and thereby preventing the detection of invalid DTMF signals.

4,313,039

TELEPHONE MODULAR DISTRIBUTING FRAME

Paul V. De Luca, Plandome Manor, and David Rawlings, Bayville, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed May 19, 1980, Ser. No. 151,420
Int. Cl.³ H04Q 1/16
U.S. Cl. 179—98 2 Claims



1. As a new article of manufacture, a prewired connector block module for use with a double-sided telephone distributing frame comprising:

a generally rectangular terminal block having a first surface including a plurality of pairs of mounting pins projecting therefrom, and a second surface through which oppositely disposed segments of said pairs of pins project;

a length of cable having a number of conductors therein corresponding to the number of said pins, said conductors being connected to individual oppositely disposed segments of said pins;

a generally rectangular connector block having provision for mounting protector modules, and interconnecting the opposite ends of conductors of said cable; and

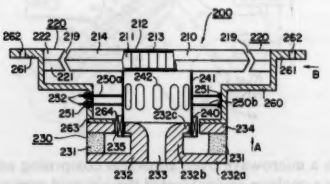
a stub cable of predetermined length having conductors therein, first ends of which are connected to said connector block, and second ends of which are free of interconnection.

4,313,040

ELECTRO-ACOUSTIC TRANSDUCER WITH FREE EDGE DIAPHRAGM

Kenkichi Tsukamoto, Kyoto, Japan

Filed May 5, 1980, Ser. No. 146,899
Claims priority, application Japan, May 15, 1979, 54-59408
Int. Cl.³ H04R 9/00
U.S. Cl. 179—115.5 R 7 Claims



1. An acoustic conversion device comprising:

a planar diaphragm which is formed by affixing a porous sheet impregnated with a damping agent on a honey-comb core constituted by honey-comb core units arranged in one plane;

a voice coil for driving said diaphragm;

an edge part which is inclined substantially symmetrically with respect to a phantom plane perpendicular to the direction of motion of said voice coil, said edge part being coupled to the periphery of said diaphragm; and

an edge receiving part having a recess substantially complementary in configuration to said edge part, thus forming a predetermined gap between said edge part and said edge receiving part.

4. An acoustic conversion device comprising:

a diaphragm;

a voice coil for driving said diaphragm;

an annular edge part connected to and surrounding the periphery of said diaphragm, said edge part having an outer surface configuration defined by a pair of frusto-conical surfaces joined together at corresponding diameters thereof in a plane of symmetry perpendicular to the direction of motion of said voice coil;

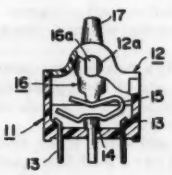
and an edge receiving part having an annular recess substantially complementary in configuration to said edge part, thus forming between said edge part and said edge receiving part at the rest position of said diaphragm a predetermined gap whose size changes with movement of said voice coil in its said direction of motion.

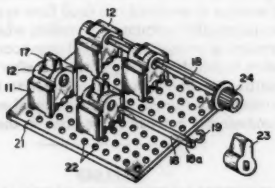
4,313,041

SMALL SWITCH

Shigeo Ohashi, 5-20 Okusawa 1-chome, Setagaya-ku, Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,238
Claims priority, application Japan, Dec. 25, 1978, 53-175930[U]; Sep. 27, 1979, 54-132613[U]
Int. Cl.³ H01H 21/02
U.S. Cl. 200—6 R 13 Claims





1. A small switch which may be used selectively as either a lever switch or as a rotary switch, comprising:

a switch housing having a pair of side faces which has a first and a second hole formed respectively on each of said side faces which face each other in the direction virtually perpendicular to that of the switching operation through which first and second holes a switching rod may be inserted, and a third hole formed at the top portion of said housing through which a knob operatively connected to the upper portion of a switching element is projected outwardly;

a main contact in said housing and consisting of stationary contacts;

a movable contact-support and a movable contact rockably mounted on said movable contact-support being embedded in the bottom portion of said housing;

and a switching element disposed on said movable contact for actuating the same, said switching element having a

fourth hole extending therethrough at a location corresponding to said first and second holes formed on said switch housing to receive said switching rod;

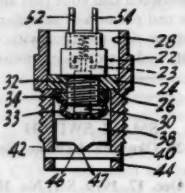
whereby said switch may be operated by one of said knob and said switching rod selectively to make or break contacts in the switch.

4,313,042

CORROSION INDICATOR

Dale L. Ehrhart, 819 Bonifant St., Silver Spring, Md. 20910

Filed Oct. 15, 1979, Ser. No. 84,665
Int. Cl.³ H01H *29/00*; G08B *17/02*
U.S. Cl. 200—61.04 **6 Claims**



1. A corrosion indicator for use in a fluid flow system having metallic passages through which the fluid flows and wherein the fluid comprises a balanced solution of water and an inhibitor to retard corrosion in the system, water being the primary fluid in the solution, said corrosion indicator comprising:

switch means having electrical contacts for connection to signal means;

means including a metallic component normally holding said contacts in one of two conditions, open or closed, but including means for moving said contacts to the other of said two conditions;

a housing for said switch means having means for connection thereof into a fluid flow system; and means on said housing maintaining said switch means against contact with the fluid solution when said housing is mounted in a fluid flow system;

said metallic component in said second mentioned means being exposed for contact with said fluid solution when said housing is mounted in a fluid flow system and subject to an undesirable amount of corrosion which may occur in the system as a result of an imbalance occuring in the fluid solution to self-destruct by corrosion after a period of time permitting the contacts to be returned to the other of said two conditions thereby to actuate signal means to indicate the undesirable corrosive condition in the system.

4,313,043

COMBINATION MICROWAVE OVEN AND EXHAUST VENT AND INSTALLATION MOUNTING METHOD THEREFOR

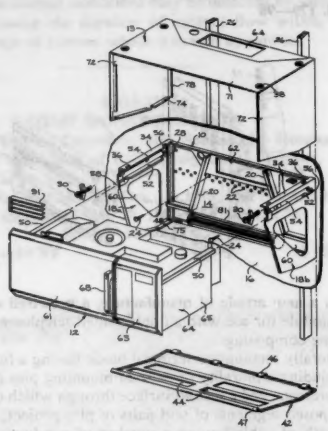
James A. White, Louisville, and Frank L. Rice, Jeffersontown, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 21, 1978, Ser. No. 935,433
Int. Cl.³ H05B *6/64*
U.S. Cl. 219—10.55 R **7 Claims**

1. A microwave oven appliance for installation as a separate unit on a vertical wall in an elevated position over a domestic cooking unit comprising:

a unitary microwave oven operating module; and

a support assembly, attachable to the vertical wall and adapted to form an enclosure closed except for a front facing opening through which said module is insertable, said assembly including a support member attachable directly to the wall for providing the primary support for said module, said module and member having cooperating support means whereby said module is supported directly by said member within said assembly, said support member comprising a substantially U-shaped bracket having a back wall and side walls extending therefrom, the side walls of said U-shaped bracket directly supporting said module and partly defining said front facing opening into which said module is inserted, said support assembly



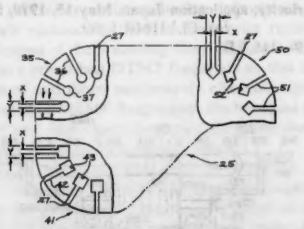
further including wall means supported by said U-shaped bracket for forming, in combination with said bracket, said enclosure, said side walls of said bracket and said module having cooperating means for slidably receiving said module into said enclosure through said front facing opening and supporting said module within said enclosure.

4,313,044

SLOT CONFIGURATION FOR CHOKE SEAL

James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 5, 1980, Ser. No. 204,125
Int. Cl.³ H05B *6/76*
U.S. Cl. 219—10.55 D **5 Claims**



1. In a microwave oven apparatus comprising an enclosure having a cooking cavity located therein, said enclosure including a first planar conductive surface which partly defines an access opening to said cavity to permit food to be placed in said cavity, means for supplying electromagnetic energy to said cooking cavity, a movable door including choke-type seal means for cooperating with said first surface for inhibiting the escape of said electromagnetic wave energy from said cavity, said seal means including a second conductive surface spaced from said first surface by a small distance and running parallel thereto to define a gap about said access opening, said second surface provided with a plurality of slots extending generally perpendicular to the longitudinal extent of said surface, the

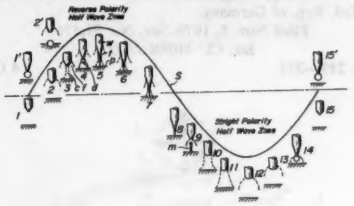
improvement wherein said slots include sections which vary in width as a function of the depth of the slot.

4,313,045

MIG ARC WELDING METHOD

Kazuo Agusa, Chiba, and Noboru Nishiyama, Ichihara, both of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP80/00024, § 371 Date Oct. 23, 1980, § 102(e) Date Oct. 23, 1980, PCT Pub. No. WO80/01770, PCT Pub. Date Sep. 4, 1980
PCT Filed Feb. 21, 1980, Ser. No. 201,408
Claims priority, application Japan, Feb. 23, 1979, 54-20577
Int. Cl.³ B23K *9/16, 35/24*
U.S. Cl. 219—74 4 Claims



1. MIG arc welding method comprising carrying out the welding by using a welding wire containing 0.02 to 0.30% in weight of rare earth elements as a welding arc stabilizing component in a pure inert shield gas, whereby a molten droplets formed at the wire tip by arc heat in the shield gas are transferred to molten metal pool surface on mother plates by instantaneous short-circuit between the wire tip and the molten metal pool surface.

4,313,046

WATER COOLED WELDING GUN

Larry O. Henry, Troy, and Cecil V. Livesay, Greenville, both of Ohio, assignors to Hobart Brothers Company, Troy, Ohio

Filed Mar. 10, 1980, Ser. No. 128,701
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—137.62 5 Claims

1. Method of assembling an arc welding torch of the type including a water-cooled inner tube having a central opening for wire and shielding gas to pass therethrough, and a cover tube mounted coaxially over said inner tube and having an adapter at one end for receiving replaceable gas shielding nozzles, the method comprising the steps of:

coating the outer surface of the inner tube with a thermally conductive, electrically insulating ceramic material,

thereafter applying a thermally conductive, electrically insulating epoxy to said coated surface, said epoxy having a thickness sufficient to fill the space between the outer surface of the ceramic material and the inner surface of the cover tube,

placing said cover tube over said inner tube while the epoxy is in a pliable state, and

curing said epoxy to form an assembled torch,

whereby the epoxy fills the gaps between the inner surface of the cover tube and the coating thereby to provide a thermally conductive path from said nozzle through said cover tube to said water cooled inner tube while maintaining the nozzle electrically isolated therefrom.

2. In an arc welding torch including a current carrying elongated inner tube having a central opening through which a consumable electrode and shielding gas may pass, means for cooling said inner tube, a gas shielding nozzle, an elongated cover tube in thermal relation with said nozzle and surrounding said inner tube, and means for providing a thermally conductive but electrically insulative connection between said nozzle and said inner tube,

the improvement comprising:

a rigid layer of thermally conducting but electrically insulating material on the outer surface of said inner tube extending substantially the length of said cover tube, and

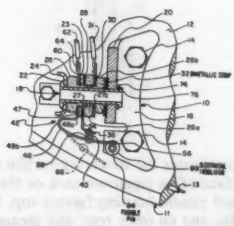
a coating of a thermally conducting but electrically insulating material which is pliable when initially placed between the inner surface of the cover tube and said rigid layer for filling the gaps therebetween, said coating becoming rigid thereafter thereby to provide an elongated thermal path whereby heat may be transferred from said nozzle and said cover tube to said inner tube while maintaining the nozzle electrically isolated therefrom.

4,313,047

COMBINED THERMOSTATIC CONTROL AND THERMAL FUSE OVERTEMPERATURE PROTECTOR FOR ELECTRICAL HEATING APPLIANCES

Charles E. Cox, Lower Providence Township, Montgomery County, and Roger V. Eeckhout, Warminster, both of Pa., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 6, 1980, Ser. No. 127,682
Int. Cl.³ H05B *1/02;* H01H *37/76;* G03D *23/08*
U.S. Cl. 219—253 7 Claims



2. In an electrical appliance having a heating element and a thermostat controlling supply of power to the heating element, the thermostat comprising a support in thermal communication with the heating element, electrical insulation means on said support holding a control member, a regulator blade positionable by the control member, a make/break blade normally cooperating with said regulator blade to establish a closed circuit, and a temperature-sensitive strip deformable to interrupt the cooperation between said normally cooperating blades, thereby opening said closed circuit, said strip being in thermal communication with said support; the combination in series circuit therewith of:

(a) an electrically conductive extension projecting from a discrete one of said make/break blade and said regulator blade, and bearing a first contact,

(b) a resilient electrically conductive blade having first and second ends, and being likewise held on said electrical insulation means in spaced electrical isolation from said

extension, said resilient blade bearing a second contact at a location remote from first end and opposite said first contact, said second end being remote from said second contact and manually deflectable to a discrete position whereby said opposed contacts are adapted to be brought forcibly into electrical communication, together with

(c) a fusible pin affixed to the support at a location immediately adjacent said second end and in the path of movement thereof when the second end is deflected to said discrete position, and

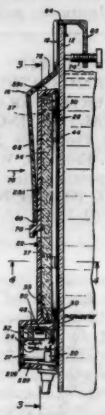
(d) an electrical isolation medium interposed between said pin and said resilient blade, said pin blocking the deflected blade in said discrete position with exertion of substantially less force on said pin than on said first contact when said second end is blocked in said discrete position, thereby reducing the effects of creep of said fusible pin, said pin being fusible at a predetermined temperature to release said resilient blade from said discrete position to open said contacts.

4,313,048

THERMOSTATICALLY CONTROLLED EXTERNALLY MOUNTED ELECTRIC AQUARIUM HEATER

Arthur J. Holbrook, Lynnfield, Mass., assignor to Rolf C. Hagen (USA) Corp., Mansfield, Mass.

Filed Oct. 10, 1978, Ser. No. 949,436
Int. Cl.³ H05B *1/02*; A01K *63/06*; H05B *3/20*
U.S. Cl. 219—311 **14 Claims**



1. Aquarium heater for mounting on the outside non-metal side wall surface of an aquarium tank or the like, comprising;

an elongated plastic housing having top, bottom, front and side walls, and an open rear, and means demarcating the housing into an upper heating section and a substantially separate lower temperature sensing section,

a metal heat transfer plate means substantially completely covering the open rear of said housing and overlying said heating and temperature sensing sections,

means mounting the heat transfer plate means to the housing,

bracket means for vertically mounting the housing to the tank with said heating section above said sensing section, said bracket means including means for forcing the heat transfer plate means into intimate contact with the tank side wall surface,

an electric heating element disposed in said heating section of the housing and means mounting the heating element to the inner surface of the heat transfer plate means,

means for receiving power coupled into the housing and connected to said heating element,

and an adjustable thermostat means disposed in the sensing section of the housing and connected in circuit with said heating element and power receiving means for controlling power to the heating element, said demarcating means essentially isolating said thermostat in said sensing section from said heating element in said heating section, said thermostat means being in direct conductive heat exchange relationship with the portion of said metal heat transfer plate means overlying said sensing section so as to be responsive essentially to the temperature thereof,

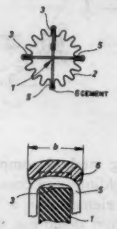
whereby once the tank water is up to temperature the heating element under control of the thermostat means cycles on and off to thereby cyclically heat the heat transfer plate means to maintain the set temperature.

4,313,049

ELECTRICAL HEATING ELEMENT FOR FLUID MEDIA

Klaus Meywald, and Helmut Ohnmacht, both of Kandel, Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,376
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—375 **4 Claims**



1. Electrical heating element for fluid and more particularly gaseous media, comprising a support plate means of insulating material having supporting edges with recesses formed therein, a resistance heating wire wound about the support means in a manner so as to be supported within the recesses and a layer of heat-resistant cement that is non-wetting with respect to the material of said heating wire applied to said support means so as only to overlie the resistance wire in a region of said edges and so as to extend into said recesses at most to a minor extent, whereby said cement forms, in the vicinity of the recesses, bridges having minimal physical contact with said resistance wire and prejudicial affects on heat dissipation are minimized.

4,313,050

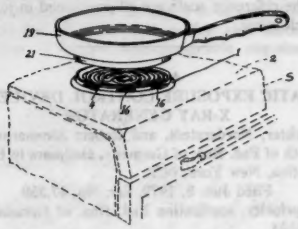
MEANS FOR ANCHORING A VESSEL TO SUPPORT IN ORDER TO PREVENT SPILLING OF THE VESSEL CONTENT

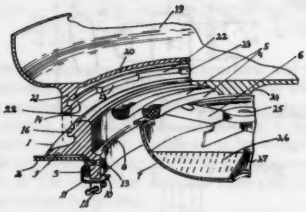
Jacques Abenaim, 12 Jolliet, St-Bruno de Montarville, Quebec, Canada (J3V 4Z1)

Filed Feb. 19, 1980, Ser. No. 122,456
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—432 **3 Claims**

1. The combination of a kitchen stove with a cooking vessel, said kitchen stove having a top wall provided with an opening, said top wall forming a downwardly depending annular flange delimiting said opening, a trim ring resting on said top wall and having a downwardly extending flange overlapping said annular flange of said top wall, means to removably secure said trim ring to said top wall against rotation and upward removal, said trim ring having a radially inwardly extending inner step, a spill-collecting cup having a peripheral rim removably resting on said step of said trim ring, said cup filling said opening, a spoked member removably resting on said rim, a heating means secured to said spoked member and located in said opening, said trim ring protruding upwardly from said top wall and having a top face and a radially outer cylindrical surface exposed above said top wall, said cooking vessel having a bottom

wall, an annular skirt downwardly depending from said bottom wall and having an inner cylindrical surface removably overlapping said outer cylindrical surface of said trim ring and with said bottom wall of said cooking vessel resting on said top face of said trim ring, and inter-engageable connector means





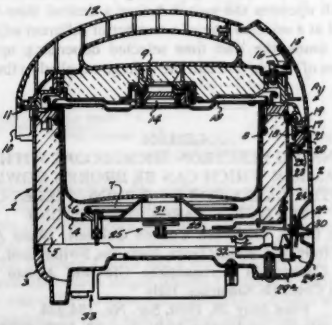
carried by the exposed radially outer cylindrical surface of said trim ring and by the inner cylindrical surface of the skirt of said cooking vessel to removably attach said cooking vessel to said trim ring upon limited rotation of said vessel relative to said trim ring.

4,313,051

ELECTRIC RICE COOKER WITH TWICE COOKING TIMER

Terutaka Aoshima, Toyohashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 7, 1980, Ser. No. 128,244
Claims priority, application Japan, Mar. 30, 1979, 54-38971
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—441 **7 Claims**



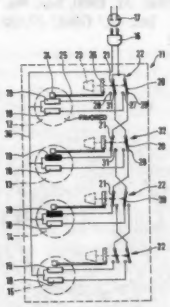
1. An electric rice cooker comprising:
a cooking kettle for containing water and rice to be cooked;
a removable lid covering the top of said kettle;
electrical heater means mounted adjacent the outside surface of said kettle for heating said kettle and the contents thereof;
thermally insulating frame means for supporting and enclosing said kettle and heater means; and
circuit means for connecting and disconnecting said heater means from a source of electrical energy to carry out a plurality of cooking steps in a predetermined period including a thermoswitch for detecting the temperature of said kettle and having a first position connecting said source to said heater means for heating said kettle and contents and a second position disconnecting said heater means in response to detection of a predetermined temperature, a means for timing having a first controlled switch in a first position connecting said timing means to said source through said thermoswitch when said thermoswitch is in said first position to activate said timing means, said first switch being shifted to a second position a first predetermined time after actuation to disconnect said timing means from said source and said timing means being reactivated when said thermoswitch is in said second position connecting said source to said timing means through said first switch and having a second controlled switch connecting said heater means to said source through said thermoswitch in said second position for a second predetermined time period beginning a third predetermined time after reactivation of said timing means.

4,313,052

COOKING UNIT

Karl Fischer, Am Gaensberg, 7519 Oberderdingen, Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,640
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—446 **10 Claims**

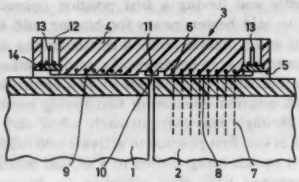


1. A cooking unit comprising:
at least one cascade cooking unit, said cascade cooking unit including a favored cooking plate having at least two electric heating elements;
at least one additional cooking plate having at least one heating element;
a thermal sensor associated with said favored plate and responsive to at least one of said heating elements of said favored cooking plate; and,
thermostatic switching means responsive to said thermal sensor, said switching means operating in a first mode to supply power solely to said elements of said favored plate, and in response to a predetermined temperature sensed by said sensor operating in a second mode to supply power to only one of said elements of said favored plate and to supply power to at least one of said elements of said at least one additional plate through a series connection.

4,313,053
WELDING SLEEVE OF THERMOPLASTIC MATERIAL

Werner Sturm, Hägendorf, Switzerland, assignor to Von Roll A.G., Switzerland, a part interest

Filed Jan. 2, 1980, Ser. No. 193,406
Int. Cl.³ H05B 3/58
U.S. Cl. 219—544 7 Claims



1. An electric welding muff for joining thermoplastic line elements, comprising

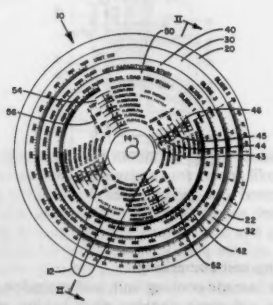
a welding sleeve formed of a length of thermoplastic pipe having opposite axial ends and having an inner wall with an annular projection extending inwardly therefrom, said annular projection being spaced axially from said axial ends of said sleeve such that said sleeve has a greater internal diameter adjacent said axial ends than along said annular projection; and

an electrical resistance heating wire arranged in a plurality of turns, said turns being entirely embedded in said annular projection.

4,313,054
PART LOAD CALCULATOR

Richard M. Martini, Solvay, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,027
Int. Cl.³ G06C 27/00
U.S. Cl. 235—78 R 7 Claims



1. A device for calculating various operational parameters of an air conditioning or refrigeration system operating at less than full load design conditions which comprises:

a first portion having a first scale for indicating the air conditioning or refrigeration load and having a plurality of indicator means in fixed relationship to the first scale;

a second portion having a second scale for indicating the capacity of the air conditioning or refrigeration equipment and having at least one third scale including a plurality of scales for various ambient temperatures coacting with the indicator means of the first portion for indicating a part load factor at various ambient temperatures;

a third portion having a fourth scale for indicating power consumption of the air conditioning or refrigeration system;

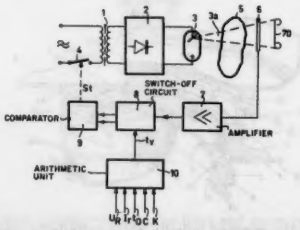
a fourth portion having a reference scale for use in indicating the part load factor; and

means for maintaining the first, second, third and fourth portions in a predetermined physical arrangement wherein the first scale, the second scale, the fourth scale and the reference scale are all positioned in juxtaposition to each other.

4,313,055
AUTOMATIC EXPOSURE CONTROL DEVICE FOR AN X-RAY GENERATOR

Detlev Richter, Norderstedt, and Robert Zimmermann, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1979, Ser. No. 47,559
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825323
Int. Cl.³ H05G 1/42
U.S. Cl. 250—322 8 Claims



1. In an automatic exposure control device for an X-ray generator, comprising:

a primary circuit including a high voltage transformer for supplying preset values of voltage and current to an X-ray tube;

a switch, connected in the primary circuit, for switching off voltage to the X-ray tube;

measuring means, for measuring X-ray dose produced by the X-ray tube and for producing a signal corresponding thereto; and

comparison means, for comparing the signal from the measuring means with a reference signal and for operating the switch in response thereto;

the improvement wherein the comparison means include switch-off means for generating a switch-off command which operates the switch before a desired dose is measured at a selected one of a number of different adjustable lead times, the lead time selected depending upon the values of the current and the voltage supplied to the X-ray tube.

4,313,056
SCANNING ELECTRON MICROSCOPE WITH A CHAMBER WHICH CAN BE BROKEN DOWN, PARTICULARLY FOR OBSERVING PIECES OF RELATIVELY LARGE DIMENSIONS

Francesco Porro, Gallarate; Cosimo Gabriele, Busto Arsizio, both of Italy, and Walter Hotz, Beringen, Switzerland, assignors to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Cascina Costa Di Samarate, Italy

Filed May 29, 1980, Ser. No. 154,224
Claims priority, application Italy, Jun. 12, 1979, 68260 A/79
Int. Cl.³ G21K 5/10
U.S. Cl. 250—442 6 Claims

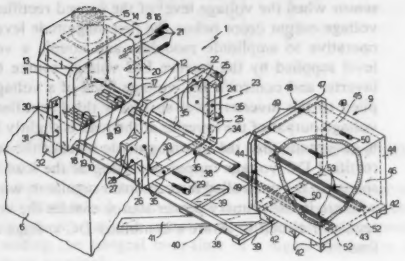
1. An electron microscope, which comprises;

a base;

a frame supported by said base by way of suspension means;

a vacuum chamber supported by said frame and comprising a first fixed portion and a second portion mobile between a position in which said first portion is open and a position in which said first portion is closed;

an electronic-optical column rigidly connected to said first portion, this latter comprising a fixed cup-shaped body with a lateral aperture arranged to be closed by said second portion, characterised in that said second portion comprises a further interchangeable cup-shaped body



with its concavity facing said aperture, and supported by substantially horizontal guide means rigid with said frame for moving from and towards said fixed cup-shaped body;

said second portion further comprising a cornice-shaped member arranged to cooperate in an airtight manner on one side with the open end of said fixed cup-shaped body, and on the other side with the open end of said further cup-shaped body; and

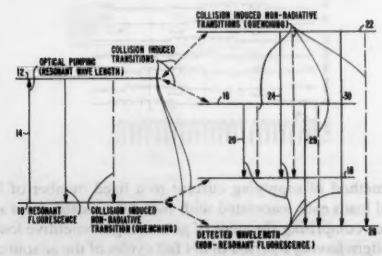
support means being provided inside said further cup-shaped body for supporting a piece holder in an adjustable position.

4,313,057

ULTRASENSITIVE TRACE ELEMENT ANALYZER

Jerry A. Gelbwachs, 309 S. Dianthus St., Manhattan Beach, Calif. 90226

Filed Nov. 28, 1977, Ser. No. 855,278
Int. Cl.³ G01J *1/58, 3/30*
U.S. Cl. 250—458 **33 Claims**


COLLISION INDUCED NON-RADIATIVE TRANSITIONS (QUENCHING)
COLLISION INDUCED TRANSITIONS
OPTICAL PUMPING (RESONANT WAVE LENGTH)
RESONANT FLUORESCENCE
COLLISION INDUCED NON-RADIATIVE TRANSITION (QUENCHING)
DETECTED WAVELENGTH (NON-RESONANT FLUORESCENCE)

1. An arrangement for detecting predetermined atoms wherein the atoms have a plurality of energy levels and photon inducible transitions between a first and a second energy level thereof at a resonant wave length and non-resonant fluorescent transition between a third and a fourth energy level thereof at a non-resonant wave length different from said resonant wave length, and collision inducible transitions between at least one of the second to third energy level transitions and fourth to first energy level transitions, comprising, in combination:

a gaseous sample containing said predetermined atoms to be detected;

photon beam generating means for generating a photon beam having a preselected intensity and said photon beam containing photons at said resonant wave length and substantially free of photons at said non-resonant wave length of said predetermined atoms for irradiating said gaseous sample with said photon beam to induce transitions of a predetermined portion of said atoms from said first to said second energy levels thereof;

buffer gas means in regions containing said gaseous sample for inducing said at least one collision inducible transitions of said atoms; and

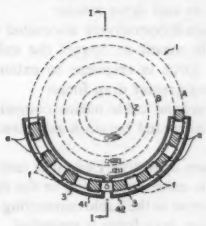
detection means in energy receiving relationship to said gaseous sample for detecting said non-resonant fluorescent wave length and generating a first information signal having a magnitude proportional to the intensity thereof whereby said intensity of said non-resonant fluorescent wave length is proportional to the atomic density of said predetermined atoms.

4,313,058

LED LIGHT SOURCE DEVICE FOR A PULSE ENCODER

Hiroshi Ishida, Tokyo, and Sunao Asahara, Hino, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 27, 1979, Ser. No. 79,480
Claims priority, application Japan, Oct. 6, 1978, 53-122730
Int. Cl.³ H01L *9/00*
U.S. Cl. 250—553 **3 Claims**



1. An LED light source device for a pulse encoder in which the light emitted by a first, a second and a third LED passes through a pattern plate having light interrupting patterns and a fixed plate having light interrupting patterns and is received by a plurality of corresponding photo cells, said pulse encoder having a plurality of code units, each of said code units having one of said LED's, a portion of said pattern plate, a portion of fixed plate and two of said photo cells, wherein said first LED, said second LED and a first resistor are connected in series to form a first branch circuit, said third LED, a second resistor and a dummy means are connected in series to form a second branch circuit, said first and second branch circuits being connected in parallel across a voltage source, whereby changes in the light characteristics of said first, second and third LEDs are equalized.

4,313,059

SEA CURRENT ENERGY SYSTEM

Gerald T. Howard, Rte. 7, Box 606, Augusta, Ga. 30906

Filed Oct. 20, 1980, Ser. No. 198,541
Int. Cl.³ F03B *13/10*
U.S. Cl. 290—54 **7 Claims**

1. System for extracting energy from in a water current, comprising:

first drag means operative to present a selectably variable drag resistance in the current;

second drag means operative to present a selectably variable drag resistance in the current;

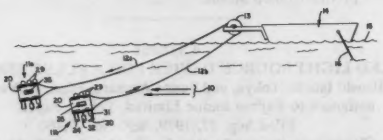
drive means located upstream of said drag means and connected to each of said drag means so that movement of one drag means away from said location causes movement

of the other drag means toward said location, and vice versa;

drag control means operative to select the drag resistance of each drag means so that the drag force of the current on one drag means is greater than the drag force of the current on the other drag means, whereby the current urges said one drag means away from said drive means and the other drag means is moved toward said drive means in opposition to the current;

work receiving means operatively associated with said drive means to be driven in response to the drag force of the current on said one drag means exceeding the drag force of the current on said other drag means;

first cable means extending between said first drag means and said drive means to transfer the drag force of the first drag means to said drive means;



second cable means extending between said second drag and said drive means to transfer the drag force of the second drag means to said drive means;

said drive means is operatively associated with said first and second cable means to retract the cable means having lesser drag force in response to extension of the cable means having greater drag force;

said first and second cable means comprising a continuous cable interconnected between said first and second drag means; and

said drive means operatively engages said continuous cable to retract the cable connecting to the drag means having lesser drag force as the cable connecting to the drag means having greater drag force is extended.

4,313,060

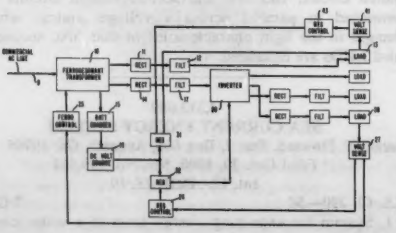
UNINTERRUPTIBLE POWER SUPPLY WITH LOAD REGULATION OF STANDBY VOLTAGE SOURCE

Hermann Fickenscher, Madison; Richard H. Hock, Landing; Richard C. Ray, Randolph Township, Morris County, and Rudolph Scuderi, Mountain Lakes, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 15, 1980, Ser. No. 121,750

Int. Cl.³ H02J *7/00*

U.S. Cl. 307—23 **8 Claims**



1. An uninterruptible power supply comprising;

input means (9) to accept an AC power source,

a controlled ferroresonant regulator (10) coupled to the input means and energized by the AC power source, a rectifier (14) coupled to the ferroresonant regulator to derive a first rectified DC voltage therefrom, an inverter (20) energized by the first rectified DC voltage, output means to accept a load (28) energized by a second rectified DC voltage output of the inverter,

characterized by

a voltage sensor (27) coupled to sense a voltage of the load and to a ferro-control (25) to control the controlled ferroresonant regulator and regulate the second rectified DC voltage output of the inverter at a first magnitude level by controlling a DC voltage level of the first rectified DC voltage, a voltage regulation circuit (32) including second input means adapted to accept a reserve DC voltage source (16) and output means to couple it to the inverter, the voltage regulation circuit responding to the voltage sensor when the voltage level of the second rectified DC voltage output drops below the first magnitude level and operative to amplitude modulate and couple a voltage level supplied by the reserve DC voltage source to the inverter and control a DC voltage level of a voltage applied to the inverter level so that a third rectified DC voltage output of the inverter at the load is slightly lower in magnitude than the first magnitude level of the second rectified DC voltage output occurring at the load in response to the controlled ferroresonant regulator, whereby a failure in the primary power source enables the voltage regulator circuit to insure a continued DC voltage at the load.

4,313,061

METHOD AND APPARATUS FOR SUPPLYING ELECTRIC CURRENT TO A NUMBER OF ELECTRICAL LOADS

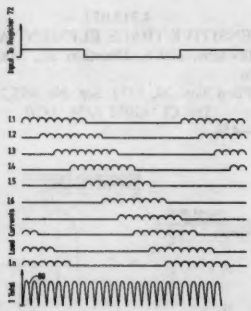
Donald G. Thomas, P.O. Box 31, Lyons, Australian Capital Territory, Australia

Filed Mar. 13, 1979, Ser. No. 20,134

Claims priority, application Australia, Mar. 14, 1978, PD3714

Int. Cl.³ H02J *5/00;* **H02M** *7/155*

U.S. Cl. 307—32 **11 Claims**

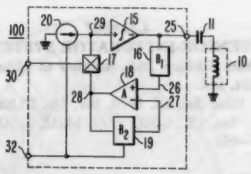


1. A method of supplying current to a fixed number of N electrical loads each associated with switching means, from an arc source comprising the steps of generating a repetitive load firing pattern having a period of nN full cycles of the ac source where n is any positive integer, and applying said pattern to said switching means so as to control the total current drawn from said ac source, the load pattern being such that (a) the currents in each of the loads are successively initiated at instants in time which are separated by n full cycles of the ac source, and (b) the current in each load is maintained for d full cycles of the ac source, where d is a selectable duty factor and is selected to be any positive integer equal to or greater than n, but less than or equal to nN, whereby after nN full cycles of said ac source the total current drawn from the ac source is variable in magnitude in accordance with the selected value of d, is sinusoidal and is equal to dI/n.

4,313,062
BIDIRECTIONAL DEFLECTOR DRIVER FOR VIDEO DISC

James A. Wilber, and Todd J Christopher, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,310
Int. Cl.³ H03K *17/00*
U.S. Cl. 307—108 7 Claims



1. A bidirection pulse generator for a record playback stylus deflection transducer comprising:

integrator means having an input terminal, an output terminal from which a drive pulse is available, said integrator means generating a signal at its output terminal approximating the integral over-time of a signal applied to its input terminal;

feedback means responsive to the signal from the integrator output terminal and a stylus direction pulse for generating one of a first and second reset conditions;

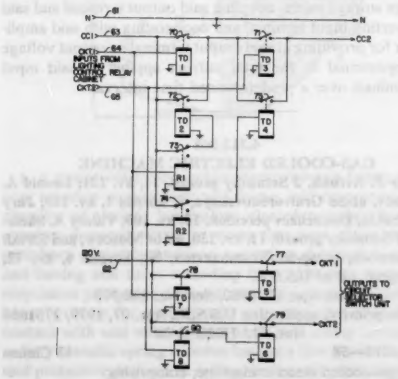
switch means responsive to a stylus deflection pulse for selectively connecting said feedback means between the integrator input and output terminals; and

a current source responsive to the stylus direction pulse for selectively applying current of a first or second polarity to the integrator means input terminal.

4,313,063
AIRPORT LIGHTING SEQUENCE CONTROL

James I. McHerron, North Syracuse, N.Y., assignor to Caloceri-nos & Spina, Liverpool, N.Y.

Filed Oct. 11, 1979, Ser. No. 83,767
Int. Cl.³ G08G *5/06*
U.S. Cl. 307—135 4 Claims



1. An airport lighting system having a plurality of groups of lights, each light group being assigned to a specific taxiway, runway or navigational aids, the combination comprising

a plurality of relay circuit means for selecting and reselecting at least one light group to be energized at any time by activation of ones of said relay circuit means operatively associated with the selected at least one light group;

selector switch means for controlling said relay circuit means;

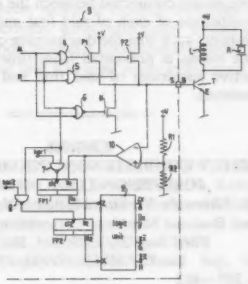
a regulated source of power connected through activated ones of said relay circuit means to the selected at least one group of lights; and

sequencing means responsive to said selector switch means for automatically deactivating said regulated source of power prior to making a new selection of at least one light group to be energized, activating the ones of said relay circuit means operatively associated with the new selection, and thereafter reactivating the source of regulated power.

4,313,064
INTEGRATED CIRCUIT DETECTING THE CHARACTERISTIC OF AN EXTERNAL SYSTEM

Mutrux Claude, Marin, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Apr. 30, 1980, Ser. No. 145,405
Claims priority, application Switzerland, May 31, 1979, 5069/79
Int. Cl.³ H03K *19/12*
U.S. Cl. 307—475 8 Claims



1. Integrated circuit detecting the characteristic of an external system, said integrated circuit comprising:

at least one output circuit means connected to an output terminal for controlling a plurality of various external systems capable to be connected to said terminal,

a detection circuit including

comparison means of the voltage on said output terminal with a voltage of reference,

memorizing means for storing the result of said comparison, and

logic circuit means connected to said memorizing means for delivering at their outputs combinations of logic states depending upon said characteristics of the external systems, said combinations of logic states permitting said integrated circuit to control said external systems in accordance with their particular characteristics.

4,313,065
SWITCHING CIRCUIT WITH MOS FIELD EFFECT TRANSISTOR

Tadao Yoshida, and Tadao Suzuki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,666
Claims priority, application Japan, Dec. 21, 1978, 53-158217
Int. Cl.³ H03F *3/18;* H03K *17/687*
U.S. Cl. 307—585 8 Claims

1. A switching circuit comprising:

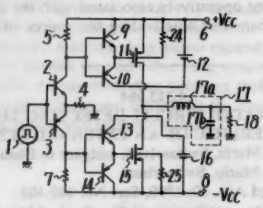
a DC voltage source having first and second terminals; first and second MOS field effect transistors each having gate, source, drain electrodes and a substrate;

circuit means for connecting the source and drain electrodes of said first and second field effect transistors in push-pull

amplifying relation between the first and second terminals of said DC voltage source;

signal supplying means for supplying a signal to drive said gate electrodes of said first and second field effect transistors;

output circuit means including inductance means and a load connected in series between the connection point of said first and second field effect transistors and a reference point so that charging and discharging currents of said



inductance means flow alternately through said source and drain electrodes of each of said first and second field effect transistors when the respective field effect transistors are in its conductive state; and

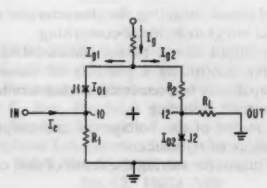
resistive means connected between the source electrode and the substrate of each of said first and second field effect transistors such that the discharging current of said inductance means is prevented from flowing through the respective substrates of said first and second field effect transistors.

4,313,066

DIRECT COUPLED NONLINEAR INJECTION JOSEPHSON LOGIC CIRCUITS

Tushar R. Gheewala, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,299
Int. Cl.³ H03K *19/195, 19/20*
U.S. Cl. 307—462 **12 Claims**



9. A Josephson device isolation gate, comprising:

a first circuit comprised of a series connection of a first resistor and a first Josephson device,

a second circuit comprised of a series connection of a second resistor having a non zero resistance and a second Josephson device,

said first and second circuits being electrically connected in parallel and having means directly coupled thereto for providing a gate current which divides and flows into said first and second circuits when said first and second Josephson devices are in their zero voltage states,

an input electrical line connected to said first circuit at a point between said first resistor and said first Josephson device,

an output electrical line directly connected to said second circuit at a point between said second resistor and said second Josephson device,

said first and second circuits being arranged to provide a parallel network in which said first resistor is electrically connected to said second Josephson device for directly injecting an input signal and said second resistor is electrically connected to said first Josephson device, said gate current being applied to said network at a point between said first Josephson device and said second resistor,

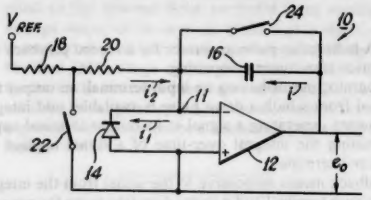
wherein gate current flows through both said first and second Josephson devices when said devices are in their superconducting state, and wherein the directions of current flow of said input current signal and said gate current are opposite to one another in one of said Josephson devices.

4,313,067

SENSOR-INTEGRATOR SYSTEM

James A. White, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 16, 1979, Ser. No. 57,883
Int. Cl.³ G06G *7/12;* H03K *5/00*
U.S. Cl. 307—494 **6 Claims**



1. A sensor-integrator comprising:

an amplifier having an inverting input terminal, a noninverting input terminal and an output terminal;

a light sensing device that provides a current which varies in accordance with the intensity of light energy applied to said device, said light sensing device having first and second terminals;

passive circuit means for direct current coupling said first and second terminals to said input terminals;

a reference current source coupled to one of said inputs and switching means coupled to said reference current source for selectively rendering said reference current source operative to supply a predetermined reference current to one of said inputs; and

charge storage means coupling said output terminal and said inverting input terminal and cooperating with said amplifier for providing at said output terminal an output voltage proportional to the total current applied to said input terminals over a predetermined time interval.

4,313,068

GAS-COOLED ELECTRIC MACHINE

Vladimir J. Avrukh, 2 Setunsky proezd, 11, kv. 121; Leonid A. Duginov, ulitsa Graivoronovskaya, 8, korpus 1, kv. 155; Jury I. Azbukin, Dokuchaev pereulok, 13, kv. 100; Valery A. Shelepov, 2 Setunsky proezd, 11, kv. 138, all of Moscow, and Elrikh I. Gurevich, prospekt Kosmonavtov, 50, korpus 4, kv. 72, Leningrad, all of U.S.S.R.

Filed Apr. 17, 1980, Ser. No. 140,978
Claims priority, application U.S.S.R., Apr. 27, 1979, 2751854
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—58 **13 Claims**

1. A gas-cooled electric machine, comprising:

a rotor; a longitudinal axis of said rotor;

a stator, making up an air gap with respect to said rotor, and having an inner surface and a transverse plane;

a core of said stator having an inner surface;

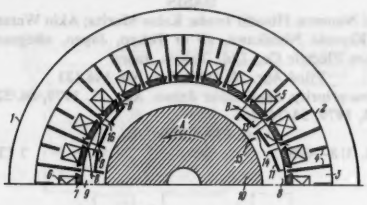
a plurality of radial ducts, and a plurality of slots on said inner surface;

windings arranged in respective slots of said core of said stator;

a plurality of slot wedges in said core holding respective windings in place;

a plurality of projections arranged in said air gap between said stator and said rotor lengthwise the longitudinal axis of said rotor and provided on at least two of said slot wedges;

a base of each of said projections, sloping towards said inner surface of said stator;



a longitudinal rib of each of said projections, adjacent an end of said base that is most removed from said stator, and facing said rotor;

two parallel side walls of each of said projections, arranged in said transverse plane of said stator and facing said inner surface of said stator;

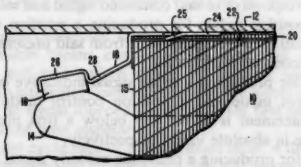
a space confined within said base of each of said projections and said inner surface of said stator and communicating with said radial ducts in said core of said stator.

4,313,069

MOUNTING FOR THERMAL PROTECTOR USED IN DYNAMOELECTRIC MACHINE STATOR WINDINGS

Arthur D. Szabo, Lima, and David Stemen, Bellefontaine, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 26, 1980, Ser. No. 124,688
Int. Cl.³ H02K *11/10*
U.S. Cl. 310—68 C **2 Claims**



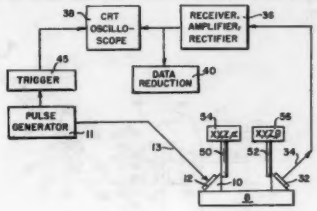
1. A dynamoelectric machine comprising: a frame; a stator core member supported in said frame, said core comprising a plurality of stacked laminations cleated together by a cleat member disposed within a recess that runs along the outer periphery of said laminations; a winding disposed in said core and having end turns extending from said core; a thermally responsive protective device disposed against said winding end turns; a clamp for holding said protective device in intimate contact with said winding end turns, said clamp comprising a unitary metallic spring member having a first portion engaging said protective device and spring biasing said protective device against said winding end turns and a second portion disposed between said frame and said core, said second portion of said clamp having a pair of pointed lances extending toward and in engagement with said stack of laminations respectively on the surface of said stack on each side of said cleat while a major surface of said second portion, opposite the direction in which said lances extend, bears against said frame for trim retention of said clamp against a longitudinal pulling force.

4,313,070

SINGLE CRYSTAL METAL WEDGES FOR SURFACE ACOUSTIC WAVE PROPAGATION

Edward S. Fisher, Wheaton, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,313
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—313 R **5 Claims**



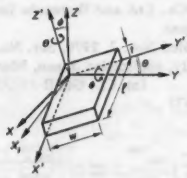
1. An acoustic wave source for introducing a Rayleigh wave into a test material comprising: a single crystal metal wedge which, with a transducer mounted thereon, is capable of exciting therein a bulk acoustic wave, said metal wedge having a bulk shear wave mode having a characteristic slow velocity less than a velocity of said Rayleigh wave introduced into the test material.

4,313,071

PIEZO-ELECTRIC QUARTZ RESONATOR

Jean Hermann, Neuchatel, and Claude Bourgeois, Bole, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Sep. 7, 1979, Ser. No. 73,559
Claims priority, application Switzerland, Sep. 8, 1978, 9442/78
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—361 **9 Claims**



1. Piezo-electric resonator comprising at least one quartz crystal in the form of a rectangular thin plate vibrating in a contour mode, wherein the cutting angle is within the range

z x wt (16°-36°)/(10°-30°).

4,313,072

LIGHT MODULATED SWITCHES AND RADIO FREQUENCY EMITTERS

Mahlon T. Wilson, and Paul J. Tallerico, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1979, Ser. No. 83,484
Int. Cl.³ H01J *25/02*
U.S. Cl. 315—5 **11 Claims**

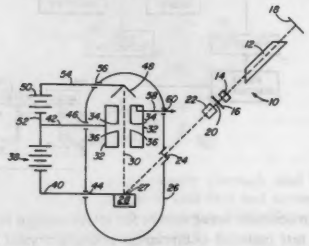
1. A light modulated electron beam driven radiofrequency emitter for power generation comprising:

means for providing reduced atmospheric pressure of at least 10^{-6} torr for a selected enclosed environment;

a radiofrequency resonator having a selected resonant frequency and period disposed within said environment;

means for providing discrete pulses of light of duration less than about 15% of said resonant period of said radiofrequency resonator at said resonant frequency or a harmonic thereof;

photocathode means within said environment for receiving said light pulses and for generating a pulsed electron beam having a time structure essentially the same as said light pulses;



electrode means for accelerating said pulsed electron beam toward said resonator to increase kinetic energy of electrons present in the pulses of said beam, said pulsed electron beam passing through said resonator and interacting therewith, thereby converting the electron kinetic energy to radiofrequency fields within said resonator;

means for withdrawing radiofrequency power from said resonator by interacting coupling means with said radiofrequency fields; and

means for transmitting said radiofrequency power out of said environment.

4,313,073

INTERACTIVE GRAPHIC APPARATUS

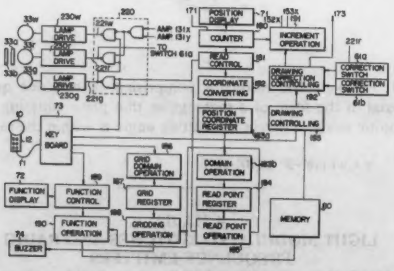
Kiyokazu Yamamoto, Urawa; Takushi Fukami, Chiba, and Teruo Takashima, Yokohama, all of Japan, assignors to Toppan Printing Co., Ltd. and Watanabe Instruments Corp., both of Tokyo, Japan

Filed Nov. 2, 1979, Ser. No. 90,747

Claims priority, application Japan, Mar. 1, 1979, 54-22539

Int. Cl.³ G05B *19/36*

U.S. Cl. 318—577 **16 Claims**



1. An interactive graphic apparatus which comprises an openable reading table having a reading section constituted by a transparent plate, a cursor provided on said reading table in a manner that it is manually movable on said reading table, a drawing head provided beneath said reading table in a manner that it is movable in X and Y directions and having a drawing instrument and a sensor movable in X and Y directions for sensing the energy from said cursor, a drawing table disposed beneath said drawing head, and a controlling device having a key board, and a display means and an external memory means to control the reading and depicting of a drafted drawing item, and which is constructed into a desk-like structure, and the external memory means is located in front of the desk-like structure.

4,313,074

SERVO CONTROL SYSTEM OPERABLE ON DIGITAL BASIS

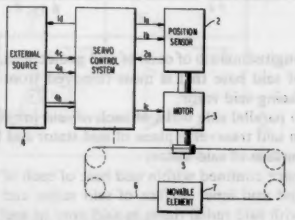
Tadashi Nomura; Hiroshi Inada; Keizo Morita; Akio Watanabe, and Kiyoaki Nishikawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,131

Claims priority, application Japan, Apr. 27, 1979, 54/52694; Dec. 14, 1979, 54/163266

Int. Cl.³ G05B *1/01*

U.S. Cl. 318—608 **7 Claims**



1. A digital servo control system responsive to a command signal indicative of a commanded position of a movable element and a phase modulated position signal having a phase indicative of a present position of said movable element, for controllably driving said movable element to said commanded position, said system comprising;

incremental position pulse producing means responsive to said phase modulated position signal for producing incremental position pulses representative of a variation in said present position;

means responsive to said command signal and said incremental position pulses for producing a position error signal indicative of a displacement from said present position to said commanded position;

means for producing a mode signal indicative of a velocity control mode and a position control mode when said displacement is above and below a first predetermined value in absolute value, respectively;

means for producing a reference velocity signal selected for said movable element in consideration of said displacement;

means responsive to said mode signal for selecting as a control signal said reference velocity signal when said mode signal indicates said velocity control mode and said position error signal when said position control mode is indicated;

means for producing an integration signal when a predetermined interval of time lapses after a generation of said mode signal indicative of said position control mode;

means responsive to said integration signal for integrating clock pulses when said displacement is below in absolute value a second predetermined value less than said first predetermined value to produce an integrated value signal;

means for adding said integrated value signal to said position error signal to produce an integrated position error signal, said control signal when said integration signal exists being said integrated position error signal; and

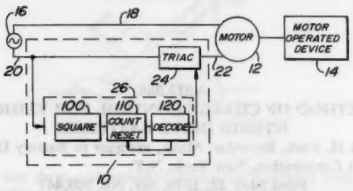
means responsive to said control signal and said position pulses for driving said movable element.

4,313,075

PROGRAMMABLE ELECTRONIC SPEED CONTROL

William G. Stewart, Pennington, N.J., and David Lawhon, Doylestown, Pa., assignors to Refreshment Machinery Incorporated, Warminster, Pa.

Filed Jun. 11, 1979, Ser. No. 47,959
Int. Cl.³ H02P 7/58
U.S. Cl. 318—722 **17 Claims**



1. Apparatus for controlling the relative speeds of the upstroke and downstroke of a pump driven by a motor responsive to an ac signal source in a beverage dispensing machine wherein the pump delivers a beverage ingredient to a beverage container during the upstroke and wherein the pump withdraws the beverage ingredient from a storage facility during the downstroke, comprising:

switch means connected between said ac signal source and said motor,

programmable means connected between said ac signal source and said switch means for causing said switch means to pass a first number of cycles of said ac signal to said motor and for causing said switch means to block a second number of cycles of said ac signal from reaching said motor during the upstroke of said pump and for continuously passing said ac signal to said motor during the downstroke of said pump,

whereby the speed of said motor during the upstroke of said pump is determined by the relationship between said first and second numbers of cycles of said ac signal.

11. Apparatus for controlling the cycle time of a program timer in a beverage dispensing machine, said program timer being driven by a motor responsive to an ac signal source, comprising:

switch means connected to said ac signal source,

programmable means connected between said ac signal source and said switch means for causing said switch means to alternately pass and block the ac signal generated by said ac signal source to said motor for first and second intervals of time respectively,

whereby the cycle time of said program timer is determined by the relationship between said first and second intervals of time.

4,313,076

DYNAMOELECTRIC MACHINE, METHOD OF OPERATING SUCH, AND CIRCUIT

William C. Rathje, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

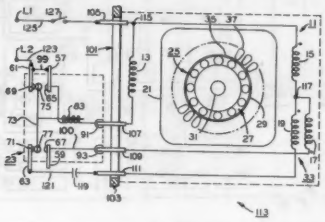
Filed May 23, 1980, Ser. No. 152,755
Int. Cl.³ H02P 1/44
U.S. Cl. 318—790 **23 Claims**

1. A dynamoelectric machine adapted for energization in both a starting mode and a running mode across a source of power, the dynamoelectric machine comprising:

a stationary assembly;

a rotatable assembly adapted to be associated in magnetic coupling relation with said stationary assembly upon the energization of the dynamoelectric machine across the power source; and

a winding circuit associated with said stationary assembly and adapted to be connected across the power source upon the energization of the dynamoelectric machine, said winding circuit including main winding means and phase winding means for connection in parallel circuit relation, and a pair of auxiliary winding means adapted for selective connection in series circuit relation with said phase winding means during the starting mode and the running mode of the dynamoelectric machine, respectively, one of said auxiliary winding means being selectively connected in the series circuit relation with said phase winding means only during the starting mode of the dynamoelectric machine so that current flow through said one auxiliary winding means and said phase winding means creates respective opposing magnetic fields, and the other of said auxiliary winding means being selectively connected in the series circuit relation with said phase winding only during the running mode of the dynamoelectric machine so that current flow through said other auxiliary winding means and said phase winding means create respective additive magnetic fields.

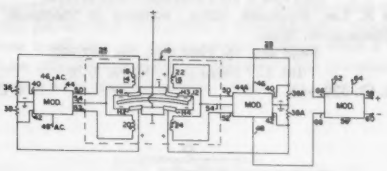


4,313,077

MAGNETIC FIELD CONTROL

Walter Haeussermann, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 11, 1980, Ser. No. 111,436
Int. Cl.³ H02P 5/28, 7/36; H02K 23/04, 23/42
U.S. Cl. 318—806 **4 Claims**



1. An electromagnetic torquing device comprising:

a fixed position electrical field and a rotor adapted to be rotated by a reaction between it and said field, and wherein:

said electrical field comprises first and second coils on at least one side of said rotor, and

the spacing between said rotor and coils is controllably varied;

a first Hall effect generator positioned between said first coil and said rotor, and a second Hall effect generator positioned between said second coil and said rotor; and

control means comprising:

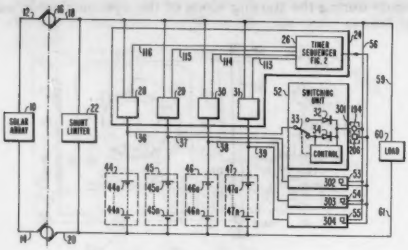
rectification means responsive to said Hall effect generators for providing a D.C. voltage, and

modulation means responsive to an A.C. voltage and said D.C. voltage for energizing said coils at a level responsive to said spacing for producing a torque on said rotor independent of said spacing as said spacing is varied between selected values.

4,313,078
BATTERY CHARGING SYSTEM

Herbert W. Bilsky, Lawrenceville, N.J., and Patrick J. Callen, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 5, 1979, Ser. No. 100,455
Int. Cl.[3] H02J 7/00
U.S. Cl. 320—15 3 Claims



1. A system for charging a plurality of batteries from a power source, comprising:

means for sensing the ampere-hour discharge of said batteries and producing a control signal indicative of such discharge;

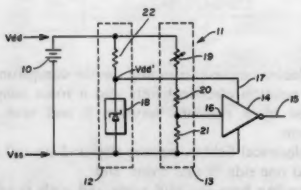
charging means coupled to said power source and responsive to said control signal for producing a relatively high charging current during a first time period proportional to the value of said control signal and for then producing a relatively low charging current; and

means coupled to said charging means and said batteries for applying said charging currents to each of said batteries in sequence for a relatively short fixed time period to partially charge said batteries and for continuously repeating the sequence of applying said charging currents to charge up all of said batteries until said batteries are fully charged or said power source is interrupted.

4,313,079
BATTERY DEPLETION MONITOR

Yan S. Lee, Plymouth, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 16, 1980, Ser. No. 112,592
Int. Cl.[3] H02J 7/10; H03K 3/26
U.S. Cl. 320—48 3 Claims



1. A battery voltage monitor for sensing and indicating battery depletion in a pacemaker comprising at least one CMOS inverter having drain, source, input gate and output connections;

said source connection connected to ground potential;

said drain connection connected to a reference voltage;

said reference voltage source producing a reference voltage lower than the undepleted battery voltage;

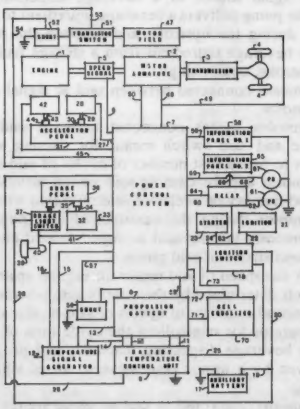
a voltage divider connected to said battery for providing a measured voltage indicative of battery depletion to said input gate, such that said measured voltage level exceeds said reference voltage level in the undepleted battery condition; and wherein

the voltage at said output connection changes from a low state to a high state to indicate the attainment of a preset depletion level when said measured voltage reaches a level substantially equal to one-half of said reference voltage.

4,313,080
METHOD OF CHARGE CONTROL FOR VEHICLE HYBRID DRIVE BATTERIES

Robert H. Park, Brewster, Mass., assignor to Battery Development Corporation, New York, N.Y.

Filed May 22, 1978, Ser. No. 908,447
Int. Cl.[3] H02J 7/32; B60L 11/12
U.S. Cl. 320—61 10 Claims



1. In a self-propelled parallel hybrid drive type vehicle which includes an electric motor and a fast discharge-recharge type propulsion battery, as well as an engine, and a fast discharge-recharge battery control system, and wherein there is provision to charge the fast discharge-recharge battery with employment of regenerative braking, and to employ supplementary charging with use of energy supplied by the engine, the method of controlling the charging of the fast discharge-recharge type battery which consists in the steps of,

1. as an override of the operator's control of regenerative braking, providing so that, if not earlier terminated as a result of operator control action, or a drop in vehicle speed, termination of regenerative braking will take place at a point in time determined, at least in part, by the history of cell current subsequent to braking initiation,

2. providing via response to time-related variations in the magnitude of battery voltage and current, to generate within the said charge control system, one or more indications of the state of charge of the fast discharge-recharge battery following discharge termination,

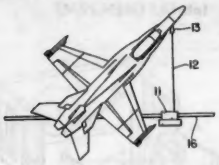
3. providing so that supplementary charging, when not held in abeyance by regenerative braking, and except when interrupted by a process of discharge, will terminate when the fast discharge-recharge battery voltage per series connected cell, attains or exceeds a value that depends on information obtained in step 2 above.

4,313,081

LINE DROP COMPENSATION DEVICE FOR AN ELECTRICAL DISTRIBUTION SYSTEM

David W. Smith, Alexandria, Va., assignor to Caci, Inc. - Federal, Arlington, Va.

Filed Apr. 1, 1980, Ser. No. 136,264
Int. Cl.[3] G05F 1/70
U.S. Cl. 323—209 7 Claims



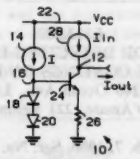
1. A line drop compensator device for a service point of an aircraft flight line electrical distribution system comprising a plurality of service points for aircraft connected at spaced locations to a three-phase power line including a neutral line, said power line connected to a single power source, means at each of said service points for sensing the current flow at that service point and generating a proportional signal, means at that service point for comparing said proportional signal with a reference signal and generating a control signal, and means at that service point responsive to said control signal for adding capacitance between a line and neutral to compensate for line inductance and any lagging power factor caused by the aircraft load at that service point so as to correct the voltage supplied to the aircraft proportional to the demand.

4,313,082

POSITIVE TEMPERATURE COEFFICIENT CURRENT SOURCE AND APPLICATIONS

Robert A. Neidorff, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1980, Ser. No. 164,625
Int. Cl.[3] G05F 3/20
U.S. Cl. 323—312 15 Claims



1. A current source for producing a current having a positive temperature coefficient, comprising:

first circuit means for producing a first current having a negative temperature coefficient; and

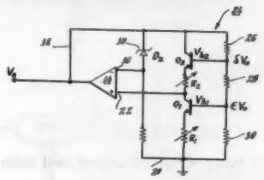
second circuit means for providing a second current independently of said first current having a temperature coefficient different from said first current, said second circuit means being coupled to said first circuit means such that said first current is subtracted from said second current to produce a difference current at a common node between said first and second circuit means having a positive temperature coefficient.

4,313,083

TEMPERATURE COMPENSATED IC VOLTAGE REFERENCE

Barrie Gilbert, Forest Grove, Oreg., and Peter R. Holloway, North Andover, Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 946,326, Sep. 27, 1978, abandoned. This application Aug. 12, 1980, Ser. No. 177,470
Int. Cl.[3] G05F 3/18, 1/613
U.S. Cl. 323—350 19 Claims



1. A temperature-compensated solid-state voltage reference comprising:

first voltage source means producing a first voltage following a voltage-vs-temperature characteristic curve with a first slope;

second voltage source means producing a second voltage and combined with said first voltage to produce a composite reference output voltage responsive to said first and second voltages, said second voltage following a voltage-vs-temperature characteristic curve with a second slope;

control circuit means operable with said second voltage source means and including means controlling two independent aspects of said characteristic curve of said second voltage source means in accordance with pre-selected parameters of the control circuit means elements, one of said aspects being the slope of the curve;

said control circuit means further including adjustable means to vary said second voltage to alter correspondingly said composite reference voltage;

said control circuit means including means under the control of said adjustable means to vary said second slope as said second voltage is changed to provide, in conjunction with said pre-selected parameters, a predetermined temperature coefficient for said composite voltage when it has been adjusted to a particular specified value pre-selected from a wide range of possible values.

4,313,084

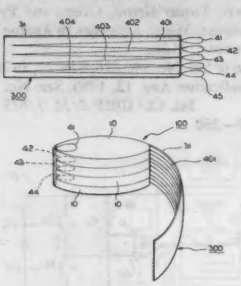
LAMINATED STRUCTURE OF DOUBLE-LAYER CAPACITOR

Masashi Hosokawa; Kei Sanada, and Takuro Kawamura, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 22,982
Claims priority, application Japan, Mar. 27, 1978, 53-35800; Mar. 27, 1978, 53-35801
Int. Cl.[3] H01C 3/10; H01G 4/40
U.S. Cl. 323—370 4 Claims

1. A laminated double-layer capacitor comprising a main capacitor body formed by laminating a plurality of double-layer capacitors unit cells so as to connect said cells in series, a group of resistors laid on a flexible sheet, each of said resistors having substantially equal resistances, and a plurality of resistor terminals connected to said respective resistors and also

connected to said unit cells so that the respective resistors are electrically connected in parallel with the respective unit cells,



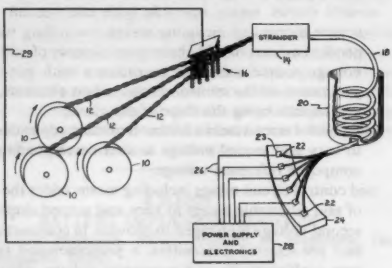
said flexible sheet being wrapped around said main capacitor body.

4,313,085

APPARATUS FOR DETECTING ADJACENT INSULATION FAULTS IN TWO OR MORE WIRES

William C. Balchunas, Mendham, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,611
Int. Cl.[3] G01R *31/14*
U.S. Cl. 324—54 **1 Claim**



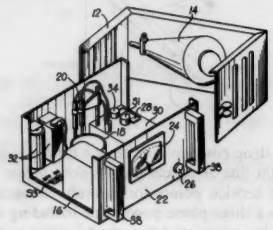
1. Apparatus for detecting the presence of adjacent faults in the insulation about wires being stranded into a cable comprising means for establishing a voltage across an uninsulated end portion of each wire and an electrode by which the wires may be passed; means for detecting a train of voltage spikes being transmitted through a wire whenever an insulation fault on that wire moves past the electrode and causes a voltage breakdown between the electrode and wire; means for generating a signal pulse upon the detection of said spike train detecting means of a spike in the train of spikes transmitted through a wire of a selected duration independent of and unextendable by subsequent spikes in said train; and means for detecting the simultaneous presence of at least a portion of at least two signal pulses generated by said signal pulse generating means upon the transmission of voltage spikes through two or more wires; and wherein said means for detecting a train of voltage spikes comprises a transistor having a gate coupled with an uninsulated end portion of a wire, and a phototransistor having lamp means coupled with the base of said transistor and a base coupled with a logic gate, whereby the phototransistor may transmit a logic signal to the logic gate upon being actuated by the transistor in response to a transistor gating voltage spike appearing in a wire, and wherein said signal pulse generating means comprises first means for generating first logic signal at the termination of a time interval commencing upon detection of a voltage spike by said spike train detecting means, and second means coupled with said first means for generating and transmitting a second logic signal to said logic gate at the termination of a time interval commencing upon receipt of a signal from said first means.

4,313,086

METHOD AND APPARATUS FOR SEPARATING OIL AND WATER AND MEASURING THE AMOUNT OF OIL

Robert A. Baum, 1932 Altura Dr., Corona Del Mar, Calif. 92625

Filed Mar. 15, 1979, Ser. No. 20,719
Int. Cl.[3] G01N *27/42*
U.S. Cl. 324—65 R **5 Claims**



1. A method of measuring relatively small amounts of hydrocarbon oil comprising:

providing a sample which includes saturated hydrocarbon oil and a first liquid which is immiscible with the oil;

providing an essentially nonconductive solvent which is essentially not soluble in the first liquid and which extracts the oil from the first liquid;

providing a conductivity additive which renders hydrocarbon oil electrically conductive but does not render the solvent electrically conductive;

mixing the sample, the solvent and the conductivity additive in a container to cause the solvent to extract oil from the first liquid to form a mixture including the oil, the solvent, and the conductivity additive with the conductivity additive rendering the oil of the mixture electrically conductive, said first liquid and said mixture having different specific gravities whereby said mixture and said first liquid are in essentially distinct layers in said container;

passing said mixture between electrodes having a known voltage difference therebetween, after the oil is rendered conductive; and

measuring the current induced between said electrodes to obtain an indication of the amount of oil in said mixture.

4,313,087

APPARATUS FOR DETECTING ELECTRICALLY CONDUCTIVE COATINGS ON DOCUMENTS

Edward H. Weitzen, 240 Ocean Ave., Lawrence, N.Y. 11559, and Salvatore F. D'Amato, 221 Bellmore St., Floral Park, N.Y. 11001

Filed Feb. 7, 1980, Ser. No. 119,511
Int. Cl.[3] G01R *27/02*
U.S. Cl. 324—65 R **7 Claims**

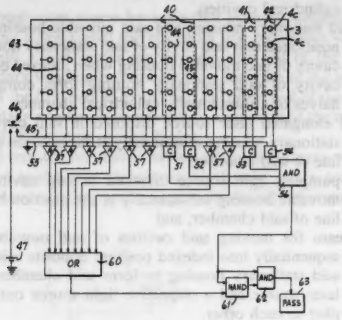
1. Apparatus for determining the genuineness of a document of electrically non-conductive material coded by means of an invisible, electrically conductive surface layer of predetermined conductance in a limited locality thereof, comprising:

a. an array of conductance sensing elements separated by insulating means, said array extending over an area greater than the area of said locality;

b. means for receiving the document in a stationary test position wherein said locality of the document is adjacent a portion only of said array of sensing elements; and

c. indicating means, including only said portion of said array of conductance sensing means, said indicating means

being operable when the conductance of said layer is within a predetermined range of said predetermined con-



ductance to produce a positive indication that the document is genuine.

4,313,088

ARRANGEMENT FOR GENERATING A CLOCK SIGNAL

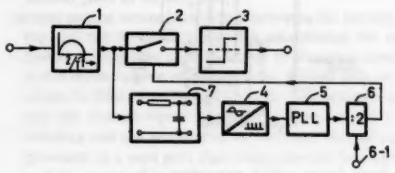
Petrus J. van Gerwen, and Wilfred A. M. Snijders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 137,866

Claims priority, application Netherlands, Apr. 20, 1979, 7903099

Int. Cl.³ H04L *7/00*

U.S. Cl. 328—63 **3 Claims**



1. An arrangement for generating a clock signal from a received data signal located in a base band, comprising a zero-crossing detector having connected thereto a frequency-selective device from which the clock signal is derived, characterized in that means are provided between the input for the received data signal and the zero-crossing detector for converting the spectrum of the received data signal into the spectrum of a bi-phase modulated signal having the bit rate as the carrier frequency and a carrier which is in-phase with the data signal.

4,313,089

PRECISION QUADRATURE ANALOG PHASE DETECTOR

Joseph P. Predina, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1980, Ser. No. 136,011

Int. Cl.³ H03C *3/00*

U.S. Cl. 328—155 **6 Claims**

1. A precision quadrature phase detector for generating an output signal that provides a measure of a difference in phase between a test signal and a reference signal, the detector comprising:

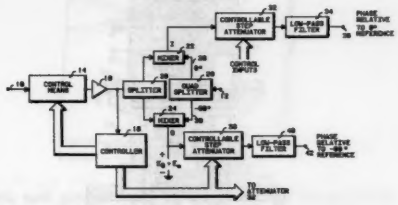
a. a level controller;

b. gain-control means connected to the level controller for receiving the test signal and producing an amplified test signal at a level held substantially constant and relatively high by the level controller;

c. an in-phase splitter connected to the gain-control means to produce a first and second split amplified test signal;

d. a quadrature splitter receiving the reference signal and producing an in-phase reference component and a quadrature reference component;

e. a first double balanced mixer connected to the in-phase splitter and the quadrature splitter, the first double balanced mixer receiving and mixing the first split amplified test signal and the in-phase reference component to produce an in-phase mixer output signal;



f. a first controllable step attenuator connected to the level controller and to the first double balanced mixer to receive the in-phase mixer output signal and produce an attenuated in-phase mixer output signal at a level controlled by the level controller; and

g. a first low-pass filter connected to the first controllable step attenuator to receive and filter the attenuated in-phase mixer output signal to produce the output signal, which output signal provides a measure of the difference in phase between the test signal and the reference signal.

4,313,090

CAR-MOUNTED AUDIO EQUIPMENT

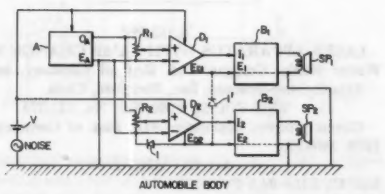
Reisuke Sato, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 8, 1980, Ser. No. 138,634

Claims priority, application Japan, Apr. 11, 1979, 54-48058[U]

Int. Cl.³ H03F *1/26, 3/68*

U.S. Cl. 330—149 **3 Claims**

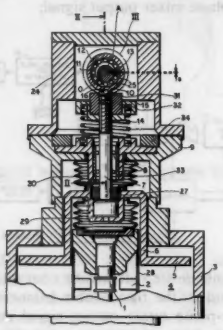


1. A car-mounted audio equipment of multiamplifier system including a single preamplifier, a plurality of power amplifiers and the corresponding number of differential amplifiers each connected between an output terminal of the preamplifier and an input terminal of each of the power amplifiers, one input terminal of the differential amplifiers being connected to the output terminal of the preamplifier and the other input terminals of the differential amplifiers being connected to a ground terminal of the preamplifier so that respective signals produced between output terminals of the differential amplifiers and the ground terminals thereof are applied to the power amplifiers, comprising a biasing means for biasing at least one of the ground terminals of the power amplifiers to a potential substantially equal to the ground potential when the one terminal is in an open state.

4,313,091
CRANKSHAFT TUNING MECHANISMS FOR MICROWAVE OSCILLATORS

Guido Busacca; Vincenzo Meli; Arcangelo Passaglia, and Michele Sanfilippo, all of Palermo, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 11, 1980, Ser. No. 120,547
Claims priority, application Italy, Feb. 13, 1979, 20141 A/79
Int. Cl.³ H01P *7/04*; H03B *9/10, 23/00*
U.S. Cl. 331—90 **6 Claims**



1. In a generator of microwaves of variable frequency provided with a resonant cavity and a tuning element in said cavity, said tuning element being linearly displaceable between two terminal positions corresponding to respective limiting frequencies,

the combination therewith of:

a rotatable crankshaft provided with an eccentric portion offset by a distance e from its axis of rotation;

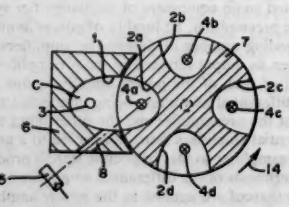
a follower ring surrounding said eccentric portion in operative engagement therewith, via interposed antifriction means, for substantially nonrotating displacement with a stroke *2e* in the direction of motion of said tuning element and with lateral excursions of like magnitude in a direction transverse thereto; and

spring means engaging said tuning element and maintaining a transverse face thereof in rolling contact with said ring for linear reciprocation by said stroke *2e*.

4,313,092
LASER APPARATUS WITH LAMP CHANGE MEANS

Walter Kaule, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Feb. 21, 1980, Ser. No. 123,371
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909173
Int. Cl.³ H01S *3/093*
U.S. Cl. 331—94.5 P **6 Claims**



1. A laser apparatus including means for automatically changing the light source used for pumping the laser comprising:

a stationary housing having a substantially semi-cylindrical cavity;

a movable housing having a plurality of substantially semi-cylindrical cavities;

said stationary housing and said movable housing being so positioned that said cavity of said stationary housing and a cavity of said movable housing when indexed opposite the cavity of said stationary housing form complementary halves of a substantially cylindrical chamber;

an elongated laser source disposed in said cavity of said stationary housing substantially at the position of the focal line of said chamber;

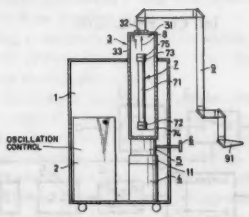
a pumping light source disposed in said cavities of said movable housing substantially at the position of the focal line of said chamber, and

means for moving said cavities of said movable housing sequentially into indexed position opposite said cavity of said stationary housing to form said chamber with said laser source and a respective light source optically coupled to each other.

4,313,093
LASER DEVICE

Norihiro Suenaga, Tokyo; Seiji Sugiyama, Sohka, and Nobuyuki Suenaga, Shizuoka, all of Japan, assignors to Nippon Infrared Industries Co., Ltd., Japan

Filed Mar. 18, 1980, Ser. No. 131,428
Claims priority, application Japan, Mar. 23, 1979, 54-33194
Int. Cl.³ H01S *3/00*
U.S. Cl. 331—94.5 D **3 Claims**



1. A laser device which comprises:

a housing having a top end with a first opening in this top end;

a laser beam oscillation device elastically supported in the housing;

said laser beam oscillation device including:

an elongated support stand arranged substantially vertically in the housing and having an upper end projecting through the first opening in said top end of said housing, said support stand having at least one axis of symmetry in its cross section perpendicular to its longitudinal axis;

a laser beam resonator mounted on the support stand for providing a laser beam having an optical axis; and means for transmitting the laser beam emitted from the laser beam resonator, said transmitting means being connected to the support stand coaxially with the optical axis of the laser beam.

4,313,094
MODULATION DEVICE FOR SUBSTITUTING FOR A DOUBLE BALANCED MIXER

Martin L. Grogan, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 17, 1979, Ser. No. 85,831
Int. Cl.³ H03C *1/58*; H03D *1/10*
U.S. Cl. 332—43 R **4 Claims**

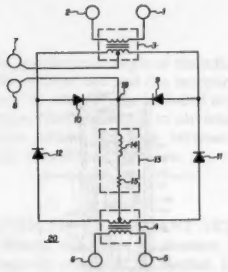
1. A modulation device, comprising:

first and second pairs of diodes, each member of the first and

second pairs of diodes being connected in series and wherein each diode has a conductive and nonconductive state;

a first transformer means having a first primary winding for applying a first signal thereto and a first secondary winding with a first center tap wherein one end of the first secondary winding is connected to a junction of the members of the first pair of diodes and the other end of the first secondary winding is connected to a junction of the members of the second pair of diodes;

a second transformer means having a second primary winding for applying a second signal thereto and a second secondary winding with a second center tap wherein one



end of the second secondary winding is connected to a first end of the first pair of diodes and the other end is connected to a first end of the second pair of diodes;

terminal means for joining a second end of the first and second pairs of diodes; and

current source means connected between the second center tap and the terminal means for minimizing the time required for the first pair of diodes to alternate conductive and nonconductive states with the second pair of diodes when the first signal is applied to the first primary winding and the second signal is applied to the second primary winding and the product of the first and second signals is provided at a sum port that comprises the first center tap and the terminal means.

4,313,095

MICROWAVE CIRCUIT WITH COPLANAR CONDUCTOR STRIPS

Andre Jean-Frederic, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 7, 1980, Ser. No. 119,563

Claims priority, application France, Feb. 13, 1979, 79 03641

Int. Cl.³ H01P *1/203, 5/12, 5/18, 9/00*

U.S. Cl. 333—116 **16 Claims**

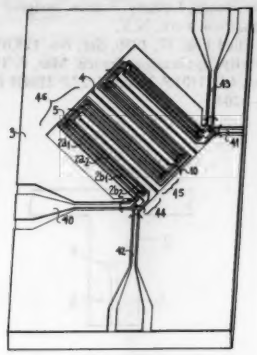
1. A microwave circuit comprising:

a dielectric substrate with a flat face;

a grounded metallic layer on an area of said face;

a multiplicity of conductor strips on another area of said face framed by said layer, said conductor strips being coplanar with said layer and being part of at least one transmission line terminating at an edge of said substrate in an ungrounded central conductor which is flanked by two zones of said layer and coplanar therewith; and

at least one ground strip on said face spacedly interleaved with certain of said conductor strips which form part of two parallel line branches terminating in respective output



lines, said ground strip having two ends conductively connected to said layer.

4,313,096

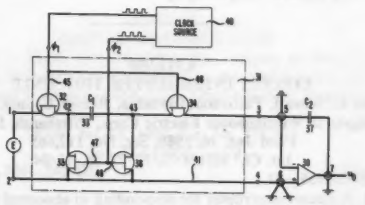
PARASITIC-FREE SWITCHED CAPACITOR NETWORK

Paul E. Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 19, 1979, Ser. No. 95,663

Int. Cl.³ H03H *19/00*

U.S. Cl. 333—173 **16 Claims**



1. A switched capacitor network having a pair of input terminals (1, 2) and a pair of output terminals (3, 4) comprising:

a first switch (22, 32), a capacitor (23, 33), and a second switch (24, 34) coupled in series between one input terminal (1) and one output terminal (3) of said network;

a third switch (26, 35) connected between the junction (98, 42) of said first switch (22, 32) and said capacitor (23, 33), and the common junction (97, 41) of the second input terminal (2) and the second output terminal (4);

a fourth switch (27, 36) connected between the junction (99, 43) of said capacitor (23, 33) and said second switch (24, 34), and said common junction (97, 41);

said first and second switches (22, 32 and 24, 34) being connected so as to be in the closed state over a common period; and

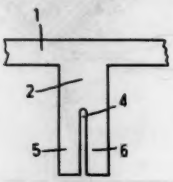
said third and fourth switches (26, 35 and 27, 36) being connected so as to be in the closed state over a common period.

4,313,097

IMAGE FREQUENCY REFLECTION MODE FILTER FOR USE IN A HIGH-FREQUENCY RECEIVER

Francois C. de Ronde, Lesigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,077
Claims priority, application France, Mar. 6, 1979, 79 05735
Int. Cl.³ H01P *1/203, 1/212;* H04B *1/26*
U.S. Cl. 333—204 9 Claims



1. A planar, image reflection mode filter for use with a receiver including an input for receiving a signal of frequency f_S, a local oscillator for supplying a signal of frequency f_{OL}, a mixer for receiving the signal of frequency f_S and the signal of frequency f_{OL}, and a planar transmission line for coupling the signals to the mixer, the filter functioning to prevent transmission of a parasitic signal having the frequency $f_p=2f_{OL}-f_S$ from the mixer to the input, said filter comprising:

A. a quarter-wavelength filter for connection at one end to the planar transmission line and having a width which is at least equal to that of the transmission line and a length which is equal to one quarter of the wave length of the signal of frequency f_p, the opposite end including a slot formed therein to enable odd-mode resonance in the quarter-wavelength filter; and

B. an adaptive circuit for connection to the planar transmission line at substantially the same point of the parasitic signal path as the quarter-wavelength filter, said circuit functioning to enable transmission without reflection of the signal of frequency f_S.

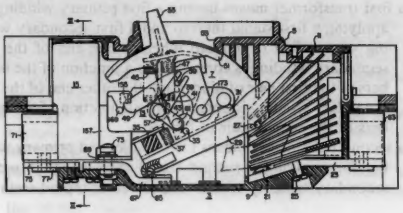
4,313,098

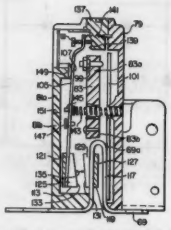
CIRCUIT INTERRUPTER TRIP UNIT

John G. Salvati, Patterson Township, Beaver County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1980, Ser. No. 112,665
Int. Cl.³ H01H *75/10, 77/06, 81/04*
U.S. Cl. 335—42 9 Claims

1. A circuit interrupter for responding to abnormal currents in the conductors of an electrical distribution system, comprising: a first insulating housing, a breaker mechanism within the housing, separable contacts adapted to be connected as part of an electrical distribution system, the breaker mechanism having a releasable member movable to an unlatched position from a latched position to effect opening of the contacts, a latch lever movable between the latched and unlatched positions of the releasable member, a trip unit including a stationary magnetic core for each conductor of the distribution system and including a coil which interacts with said magnetic core and an armature which interacts with said magnetic core, the trip unit including a trip bar movable to unlatch the latch lever and being biased in a latched position, the trip unit also including lever means associated with each stationary magnetic structure for moving the trip bar to an unlatched position, the lever means including the armature and being movable in response to abnormal currents in at least one of the conductors, the lever means including a lever on which the armature is mounted at a location spaced from the lever pivot, the magnetic core and the armature having abutting surface areas that are disposed in planes that are generally parallel when separated, whereby





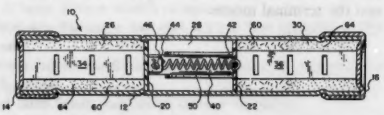
constant spacing during closing between said areas is maintained.

4,313,099

CURRENT LIMITING FUSE HAVING ALUMINUM SULFATE ARC-QUENCHING FILLER

John Ackermann, Belleville, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jan. 3, 1980, Ser. No. 109,238
Int. Cl.³ H01H *85/18*
U.S. Cl. 337—162 17 Claims



1. A current limiting fuse comprising:

a fusible element; and

an arc quenching medium surrounding said fusible element, said arc quenching medium comprising aluminum sulfate.

4,313,100

FUSE TUBE WITH MILDLY TAPERED BORE

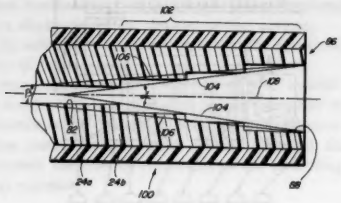
E. William Schmunk, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Mar. 24, 1980, Ser. No. 132,922
Int. Cl.³ H01H *85/38*
U.S. Cl. 337—168 10 Claims

1. An improved fuse cutout of the type including an elongated fuse tube with an ablative-arc-extinguishing-material-containing central bore formed longitudinally therethrough between a first closed end and a second open end of the bore, a stationary contact nearer the first end within the bore, and a movable contact separable from the stationary contact and movable toward the second end through the bore; an arc established between the separating contacts decomposing the arc-extinguishing material to effect the rapid evolution there-

from of large amounts of de-ionizing, cooling and turbulent gases, which are exhausted from the second end, for extinguishing the arc; wherein the improvement comprises:

the bore being mildly tapered so as to have a smaller diameter closer to the first end and a greater diameter at the



second end, the included angle of the mild taper measured between the exhaust end and the inception of taper being from about 1° to about 3°, the included angle and length of the mild taper being sufficient to obviate both stagnation of the gases within the bore between the separating contacts and clogging of the bore.

4,313,101

ELECTRICALLY IMPEDANT ARTICLES

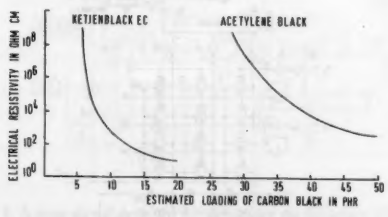
Frederick W. Bloore, and Peter H. Seaman, both of Wolverhampton, England, assignors to Hotfoil Limited, Wolverhampton, England

Filed May 17, 1979, Ser. No. 40,067

Claims priority, application United Kingdom, May 18, 1978, 20418/78

Int. Cl.³ H01C *3/06, 7/00*

U.S. Cl. 338—212 **8 Claims**



1. An electrically impedant article comprising an electrode embedded in a polymeric body having dispersed therein electrically conductive carbon black wherein the body region around the electrode is of higher electrical conductivity than the remainder of the body and contains a lower percantage of electrically conductive carbon black than does the body in other regions further away from the electrode, the carbon black in said region around the electrode being of higher conductivity than the carbon black in said other regions, the percentage contents being expressed in weight percent based on the weight of polymer content.

4,313,102

LEVEL SENSING DEVICE FOR DIELECTRIC LIQUIDS

Costantino Broetto, Milan, Italy, assignor to Fratelli Borletti S.p.A., Milan, Italy

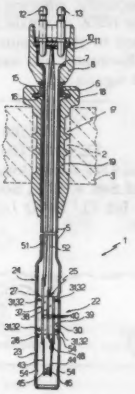
Filed Nov. 2, 1979, Ser. No. 90,524

Claims priority, application Italy, Nov. 7, 1978, 53869/78[U]

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—59 **10 Claims**

1. A device for sensing the presence of a dielectric liquid at a predetermined level in a tank, comprising first and second bimetallic strips having substantially identical thermal characteristics, each of said strips bearing an electric contact, said contacts forming a low resistance electrical path when said contacts are closed and a high resistance electrical path when said contacts are opened, said strips being adapted to be disposed in said tank in contact with the dielectric fluid at a level equal to said predetermined level; a source of electric current; a resistor connected between a switching element and one of said contacts and disposed in heat exchange proximity for heating said second strip; a timer circuit for periodically operating said switching element to provide current flow through said resistor; and a memory circuit having a signal input connected to the other of said contacts and an enabling input responsive to said timer circuit, said memory circuit providing an electrical output signal only when enabled by said timing circuit whenever a change in the resistive path between said contacts occurs, said device operating to produce said output signal when the level of liquid in the tank falls below said predetermined level.



4,313,103

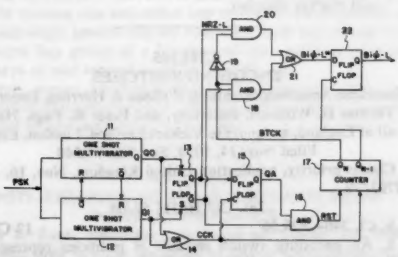
DIGITAL DEMODULATOR

Thomas A. Shull, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 18, 1980, Ser. No. 171,928

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **7 Claims**



6. A digital demodulator for converting PCM data from PSK signals to NRZ-L signals and bit clock signals comprising:

a first one-shot multivibrator that is activated on the leading

edges of pulses applied to it, connected to receive said PSK signals;

a second one-shot multivibrator that is activated on the following edges of pulses applied to it, connected to receive said PSK signals;

the inverted outputs of said first and second one-shot multivibrators connected to the reset inputs of the second and first one-shot multivibrators, respectively;

a flip-flop having its reset and set inputs connected to the normal outputs of said first and second one-shot multivibrators, respectively; whereby the normal output of said flip-flop is the NRZ-L signals; and

means connected to the outputs of said first and second one-shot multivibrator and said flip-flop for generating said bit clock signals.

4,313,104

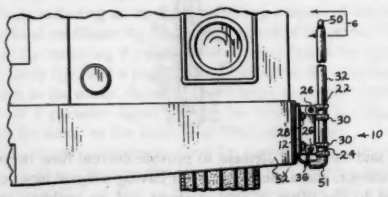
FENDER GUIDE

Edward J. Phillips, 1321 Union Ave., Kansas City, Mo. 64101

Filed Sep. 4, 1979, Ser. No. 72,423

Int. Cl.³ B60Q *1/32, 1/48*

U.S. Cl. 340—102 **5 Claims**



5. In combination with a bumper of a vehicle, a fender guide having an elongated upright marker member mounted thereto for visually locating the outboard side of the body of the vehicle, the improvement comprising means for mounting said marker member to said bumper for movement through a horizontally disposed arc lying adjacent to the end of said bumper comprising:

a hinge assembly on the lower portion of said marker member for mounting said member to said end of said bumper for swingable movement through said arc as defined by a normal position selected by an operator of the vehicle at which said marker member is spaced laterally away from the bumper and a retracted position in substantial front-to-back alignment with said end of the bumper; and

means engaging said hinge assembly for applying a selectable holding force thereto to maintain said marker member in said normal position and for allowing movement of said member through said arc and towards said retracted position in response to a greater opposing force applied to said marker member.

4,313,105

ENCODING SWITCHES

Manickam Ananthan, Romford; William J. Herring, Dagenham; Thomas D. Williams, Billericay, and Peter B. Page, Harlow, all of England, assignors to Vickers Limited, London, England

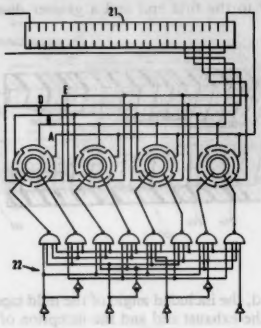
Filed Nov. 14, 1979, Ser. No. 94,240

Claims priority, application United Kingdom, Nov. 16, 1978, 44793/78

Int. Cl.³ H01H *67/08*

U.S. Cl. 340—825.56 **12 Claims**

1. An encoding switch settable at positions representing different decimal digits for providing binary coded outputs representing the decimal digits, the switch comprising five conductive elements having first and second parts connected together, said first parts being allocated to provide one 1-out-of-5 code and said second parts being allocated to provide another 1-out-of-5 code, and a rotatable contact means arranged to be set at predetermined positions to select one of such first parts and one of said second parts of a different conductive element, whereby two 5-bit words, each word



containing one and only one "1" (or "0" for complementary coded switches), can be derived by separately electronically reading said first and second parts and the required encoded decimal digit derived by combining said two 5-bit words.

4,313,106

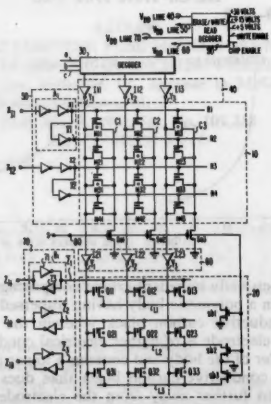
ELECTRICALLY PROGRAMMABLE LOGIC ARRAY

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,677

Int. Cl.³ G11C *11/40*

U.S. Cl. 340—825.91 **7 Claims**



1. The combination comprising:

a plurality of electrically alterable floating gate devices arranged in rows and columns, each one of said devices having a control electrode and source and drain electrodes defining the ends of a conduction path, each one of said devices being of the type which assumes a first threshold voltage condition (V_{T1}) when its gate is made positive with respect to its drain by more than a given voltage (V_G) and which assumes a second threshold voltage condition (V_{T2}) when its gate is made negative with respect to its drain by more than said given voltage;

a row conductor per row, each row conductor being connected to the control electrodes of the devices of that row;

means pairing the row conductors including means for applying an input signal (Xi) to one conductor of a pair of row conductors and the complement of that signal (Xi) to the

other conductor of the pair; each pair of row conductors having a different input signal applied to it;

first and second column conductors per column; the first column conductor of each column being connected to the drain electrodes of the devices of that column and the second column conductor of each column being connected to the source electrodes of the devices of that column;

means for selectively applying signals to the first column conductor of each column;

a switching transistor for each one of said second column conductors, each one of said switching transistor having its conduction path connected between its respective second column conductor and a point of fixed potential; and means connecting the control electrodes of the switching transistors in common.

4,313,107

TONE SIGNAL DETECTORS

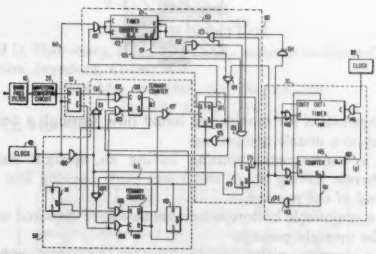
Toshihiro Mori, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1978, Ser. No. 972,176

Claims priority, application Japan, Dec. 23, 1977, 52-174744[U]

Int. Cl.[2] H04Q *9/00;* **H04M** *11/02;* **G01R** *23/02*

U.S. Cl. 340—825.71 **3 Claims**



1. A tone signal detector for detecting the presence of predetermined tone signals, comprising:

first means for waveform-converting applied tone signals to generate complementary gating pulses;

second means for generating clock pulses;

third means coupled to both said first and second means for selectively passing said clock pulses according to one of said complementary gating pulses;

fourth means coupled to both said first and second means for selectively passing said clock pulses to pass therethrough according to the other of said complementary gating pulse;

fifth means coupled to said third means for counting the passed clock pulses and generating a first detecting pulse upon counting the same up to a predetermined number during a predetermined time interval;

sixth means coupled to said fourth means for counting the passed clock pulses and generating a second detecting pulse upon counting the same up to said predetermined number during said predetermined time interval; and

seventh means coupled to both said fifth and sixth means for resetting said sixth means if said first detecting pulse occurs prior to said second detecting pulse and resetting said fifth means if said second detecting pulse occurs prior to said first detecting pulse.

4,313,108

ELECTRIC APPARATUS FOR DISPLAYING A PLURALITY OF KEY SYMBOLS ON A SINGLE PASSIVE DISPLAY

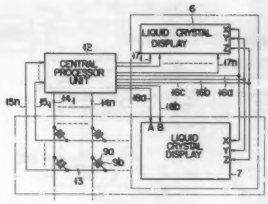
Junichi Yoshida, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,053

Claims priority, application Japan, Dec. 7, 1978, 53-152149; Dec. 8, 1978, 53-152475; Dec. 21, 1978, 53-157955; Dec. 21, 1978, 53-157956; Dec. 27, 1978, 53-161876

Int. Cl.[3] G06F *3/02;* **G09F** *9/35*

U.S. Cl. 340—365 VL **7 Claims**



1. An electrical apparatus for displaying a plurality of key symbols on a single passive display comprising:

keyboard means including a first input key group comprised of a plurality of input keys for selectively inputting at least numeral data and function data, each of the input keys of the first input key group having at least two key symbols representing numerals and/or functions associated therewith; and a second input key group comprised of input keys for causing one of said at least two key symbols corresponding to each of the input keys of the first input key group to be selectively displayed;

a single passive display means disposed under said keyboard means to selectively display one of said at least two key symbols for each of the input keys of the first input key group, said single passive display means including two electrode substrates (**19***a*, **19***b*) stacked one over the other, electrodes (**21**, **22**, **23**, **25**) provided respectively on said substrates and between which a liquid layer is sealed, one of said electrode substrates including electrodes (**21**, **22** and **23**) provided on those areas of said one substrate corresponding to said keys of said first input key group to represent at least two key symbols for each key of said first input key group;

central processing unit means electrically connected between said keyboard means and said single passive display means to perform a predetermined calculation based on the numeral data and function data which are inputted by the operation of the keys of said first input key group, and for causing one respective key symbol to be displayed on said single passive display means for each key of said first input key group as a function of the operation of input keys of said second input key group; and

output means connected to said central processing unit means to display a result of said calculation performed by said central processing unit means.

4,313,109

INITIALIZATION CONTROL FOR LIGHT BEAM POSITION INDICATOR

Buddy K. Funk, Bountiful, and David M. Fowler, III, West Jordan, both of Utah, assignors to Sperry Corporation, New York, N.Y.

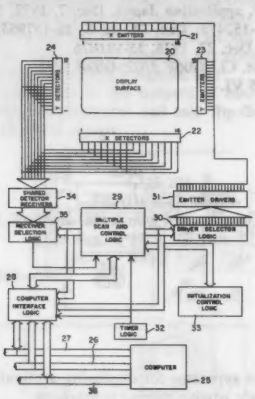
Filed Dec. 11, 1979, Ser. No. 102,586

Int. Cl.[3] G08C *21/00*

U.S. Cl. 340—365 P **17 Claims**

1. In a scanning system for scanning a display surface with light beams including a plurality of paired light emitting

sources and oppositely positioned light detectors adjacent respective opposite edges of a display surface and scan means for sequentially activating said emitting sources and oppositely positioned detectors in predetermined patterns to scan said display surface with light beams emitted by said sources and impinging on said detectors, the improvement comprising:



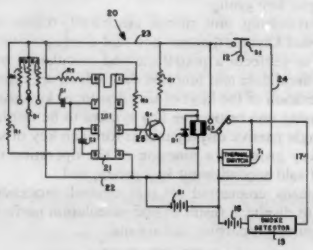
means responsive to the first detection by one of said detectors of an interruption of a light beam for generating a first signal; and

means responsive to said first signal for interrupting said sequential activation of said sources and detectors and for resetting said scan means to an initial condition to thus initialize said system.

4,313,110
SMOKE ALARM HAVING TEMPORARY DISABLING FEATURES

Thomas Subulak, 3605 Fenn Dr., Philadelphia, Pa. 19154, and Joseph M. Milewski, 146 E. Louden St., Philadelphia, Pa. 19120

Filed Feb. 19, 1980, Ser. No. 122,654
Int. Cl.³ G08B *21/00, 17/10*
U.S. Cl. 340—527 **8 Claims**



1. A smoke alarm device, comprising:

a housing;

means for supplying electrical power in said housing;

means in said housing for detecting smoke and producing a sensible signal in response to detected smoke; and

manually-actuated control means cooperating with said signal-producing means to temporarily deactivate the same and to automatically reactivate the same after a predetermined time interval, said control means including:

an integrated circuit timer having an input adapted to receive an electrical signal to initiate timing and having an output adapted to produce an electrical output signal upon completion of a predetermined time interval;

electrically-actuated means connected to said smoke detector and sensible signal producing means and operable in alternate modes to permit or to prevent a sensible signal from being produced in response to sensed smoke;

means for latching said electrically-actuated means in its signal preventing mode;

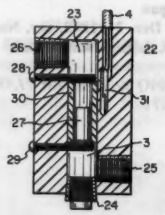
momentary-contact switch means in said housing coupled to said timer and said latching means for producing said timer input signal and for actuating said latching means; and

means connected to said timer output and said latching means for deactivating said latching means at the completion of said time delay and thereby reactivating said smoke detecting and sensible signal producing means.

4,313,111
NOZZLE CONDITION MONITOR

Jack W. Anderson, Rte. #1, East Berlin, Pa. 17316

Filed May 12, 1980, Ser. No. 148,599
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—606 **4 Claims**



1. Apparatus for monitoring liquid flow through a conduit leading to a nozzle comprising:

(a) a nonmagnetic housing having an up-right passage therein having upper and lower ports opening into each end of the passage,

(b) a removable hollow nonmagnetic sleeve disposed within the up-right passage,

(c) a magnetic piston arranged within the sleeve such that flow may take place along the sides of the piston from the lower port to the upper port and such that when the flow is sufficient, the piston is carried upward within the sleeve,

(d) stoppers arranged to hold the sleeve within the up-right passage and to restrict the travel of the piston to prevent the piston from moving into a position adjacent to either port,

(e) a magnetic switch arranged near the up-right passage near one of the extremes of travel of the magnetic piston such that when the piston is at one of its extreme positions it will close the magnetic switch, and

(f) means for detecting the condition of closure of the magnetic switch to produce an electrical signal indicative of whether or not flow through the passage is taking place.

4,313,112
COMPUTER WORK STATION ASSEMBLY AND MOUNTING APPARATUS THEREFOR

Daniel F. Foster, 7160 S. Vine Clr. E., Littleton, Colo. 80122

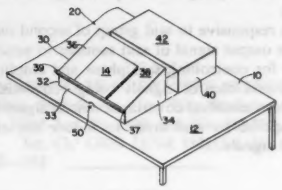
Filed Dec. 17, 1979, Ser. No. 104,385
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—700 **21 Claims**

1. A mounting stand for a cathode ray tube display screen and keyboard work station comprising:

a first portion having a front region located in a vertical plane and terminating at a first height, a back region gen-

erally parallel to the front region and extending up to a height greater than the height of the front region, a copy support surface starting from the top of the front region and inclined upwardly to the top of the back region to define the copy support surface for holding copy material,

a second portion comprising means defining a further support surface starting adjacent the said back region of the first portion and at a height less than the said second height and extending generally horizontally in a direction away from the first portion for removably holding a separate cathode ray tube device thereon such that its display screen is above said second height,



said front region, copy support surface, back region and further support surface being generally aligned, front to back, such that for an operator suitably positioned to operate a keyboard located immediately in front of the front region, a display screen mounted on the further support surface will be at eye level with the copy support surface located in line between the keyboard and the display screen.

4,313,113

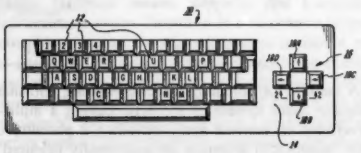
CURSOR CONTROL

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1980, Ser. No. 133,365

Int. Cl.³ G06F 3/14

U.S. Cl. 340—709 **1 Claim**



1. A graphic input device for controlling the movement of a cursor upon a visual display, characterized by including,

variable resistance pressure transducer means including four sets of switches, each controlling cursor movement in one of four orthogonal directions and comprising,

first electrode means, including a resistive elastomeric pad, for selecting the direction of movement of the cursor, and

second electrode means, including a spherical contact, spaced from said first electrode means,

one of said first or second electrode means being mounted for movement upon a cantilever spring arm,

force transmitting means, associated with and overlying each of said switches and comprising four finger actuable keys arranged in a diamond pattern with the free ends of said underlying cantilever spring arms meeting at the center of the diamond, for actuating said transducer means by moving said cantilever spring arms so as to vary the electrical resistance across said first and second electrode means in an inverse relationship to the applied pressure, and

circuit means connecting said variable resistance pressure transducer means to said visual display for moving the cursor in a selected direction at a slow speed when a high resistance condition is present and at a higher speed in the selected direction as said resistance condition is lowered.

4,313,114

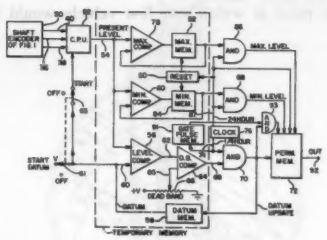
LIQUID LEVEL RECORDER APPARATUS AND METHOD FOR STORING LEVEL DIFFERENCES IN MEMORY

Harold G. Lee, and Indra K. Bishnoi, both of Portland, Oreg., assignors to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed May 30, 1980, Ser. No. 154,673

Int. Cl.³ G08G 19/16, 25/04

U.S. Cl. 340—870.23 **15 Claims**



1. Recorder apparatus, comprising:

input means for supplying a group of electrical pulses for each measured change in a variable quantity so that the sequence of the pulses in said group indicates whether said change was an increase or decrease from the previous reading;

signal processing means connected to said input means, for processing each group of pulses and producing a present measured value output signal corresponding to the value of the measured variable quantity;

first memory means having one input connected to the output of said signal processing means for comparing said present value signal with a reference datum signal on another input corresponding to a previous measured value signal stored in a storage means in said first memory means to produce a difference signal at its output;

second memory means for recording and storing said difference signal;

first gate means for transmitting said difference signal from the first memory means to said second memory means in response to a gate pulse applied to said first gate means for a time interval corresponding to the width of the gate pulse; and

feedback means for transmitting said difference signal from the output of said gate means to said storage means to update said reference datum signal and for transmitting said reference datum signal from said storage means to the other input of said first memory means.

4,313,115

COLLISION AVOIDANCE APPARATUS

James P. O'Sullivan, Purley, England, assignor to Sperry Limited, Bracknell, England

Filed Apr. 23, 1979, Ser. No. 32,056

Claims priority, application United Kingdom, May 10, 1978, 18604/78

Int. Cl.³ G01S 7/22

U.S. Cl. 343—5 EM **3 Claims**

1. Apparatus for assessing maneuvers of a first vehicle to avoid collision with other vehicles comprising

sensing means for providing signals representative of the positions and velocities of the first vehicle and the other vehicles,

computing means responsive to said signals for computing closed regions respectively associated with said other

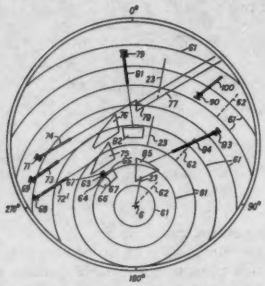
vehicles, which regions if avoided by said first vehicle assure that said first vehicle will not pass closer to said other vehicles than a predetermined distance for all relative positions and velocities thereof,

the periphery of each of said regions being defined by lines joining the following points:

the point at which said first vehicle would be at said predetermined distance (CPA) from the other vehicle in question when on a heading to cause the other vehicle to pass ahead (ahead CPA point);

the possible point of collision (PPC) of said first vehicle and the other vehicle in question based on the present speeds of the two vehicles and the present heading of the other vehicle;

the point at which said first vehicle would be at said



predetermined distance (CPA) from the other vehicle in question when on a heading to cause the other vehicle to pass astern (astern CPA point);

and the points of intersection of a line parallel to the heading of the other vehicle in question, and spaced from it by said predetermined distance (CPA) on the side nearest to said first vehicle, with said astern and ahead headings of said first vehicle,

said computing means comprising means for computing said lines, and

display means coupled to said computing means for displaying said regions relative to the position of said first vehicle, said display means comprising means for displaying said lines,

thereby providing indicia to assess maneuvers of said first vehicle to avoid collision with said other vehicles.

4,313,116

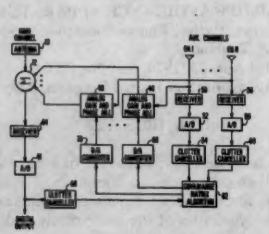
HYBRID ADAPTIVE SIDELOBE CANCELING SYSTEM

Norman F. Powell, Ilchester; Henry E. Lee, Columbia, and Francisco J. Guillen, Ellicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1980, Ser. No. 116,681

Int. Cl.³ H04B 7/00

U.S. Cl. 343—100 LE **7 Claims**



1. An adaptive sidelobe canceler comprising:

(a) an array of sensing elements each producing an output signal in response to a signal impinging upon said sensing elements;

(b) apparatus for combining said output signals to produce a composite signal;

(c) means coupled to selected sensing elements of said array to produce a group of second output signals in response to a signal impinging on said sensing elements;

(d) phase and amplitude control means for coupling each signal comprising said group of second output signals to the input of a summing circuit;

(e) means for coupling said composite signal to said summing circuit;

(f) means responsive to said group of second output signals and the output signal of said summer to produce control signals for controlling said phase and amplitude control means, said control signals being sequentially updated based on a modified covariance matrix algorithm to adapt the response by said array to reduce the effect of unwanted signals.

4,313,117

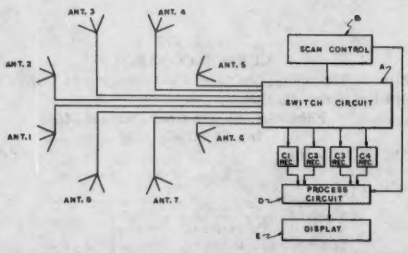
METHOD AND APPARATUS FOR ELECTRICALLY SCANNING AN ANTENNA ARRAY IN A MONOPULSE DF RADAR SYSTEM

Stephen E. Lipsky, Kings Point, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Jun. 21, 1979, Ser. No. 50,346

Int. Cl.³ G01S 3/32

U.S. Cl. 343—119 **36 Claims**



1. A method for obtaining direction finding information in a monopulse radar system of the type having a multi-channel receiver and an antenna array including a plurality of fixed, narrow beamwidth antennas geographically oriented to provide omnidirectional coverage, the method comprising the steps of:

(a) selecting a first set of antennas from the array, said first selected set comprising a plurality of pairs of oppositely oriented antennas;

(b) combining the RF output signals of the antennas in each pair of said first selected set to form a combined output signal for each pair;

(c) processing each of said combined output signals in a different receiver channel to form a first processed output signal for each channel;

(d) selecting the strongest and next strongest first processed output signals;

(e) forming a monopulse ratio from the selected first processed output signals;

(f) selecting a second set of antennas from the array, said second selected set comprising the pair of antennas from the previously selected first antenna set generating the strongest first processed output signal;

(g) processing the RF output signals of the antennas in said second selected set, in different receiver channels, to form a second processed output signal for each channel;

(h) selecting the stronger of the second processed output signals;

(i) determining the sector of the antenna in said second set connected to the channel generating the selected second processed signal; and

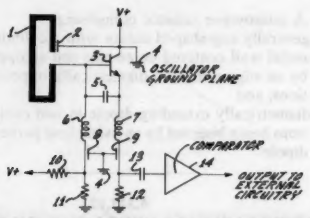
(j) combining information relating to the determined sector with the monopulse ratio to determine the angle of arrival sector.

4,313,118

MICROWAVE PROXIMITY SENSOR

Noel M. Calvin, 2683 Buena Vista Way, Berkeley, Calif. 94708

Filed Jun. 30, 1980, Ser. No. 164,805
Int. Cl.[3] G01S 13/04; H01Q 1/26
U.S. Cl. 343—701 2 Claims



1. A microwave proximity sensor comprising:

microwave oscillator means, said microwave oscillator means including ¼-wavelength dipole antenna means connected to comprise tank circuit means, and further including microwave oscillator means coupled to said ¼-wavelength dipole antenna means to function as lumped constant oscillator means, whereby said ¼-wavelength dipole antenna means functions as a resonance frequency determining element for said microwave oscillator means, said ¼-wavelength dipole antenna means being connected to radiate energy generated by said microwave oscillator means and to receive energy reflected back from reflective objects, the impedance of said ¼-wavelength dipole antenna means being variable in response to the phase and amplitude of said reflected energy, and the power consumed by said microwave oscillator means being related to the impedance of said ¼-wavelength dipole antenna means;

converter means for converting power to voltage whereby a voltage proportional to said power consumption of said microwave oscillator means is generated, said converter means comprising constant current source means connected to said oscillator means as a power supply therefor such that the voltage drop across said constant current source means is substantially proportional to the power consumption of said microwave oscillator means;

comparator means coupled to said constant current source means for producing output responsive to changes in said voltage;

pulse generator means coupled to said constant current source means, said pulse generator means producing pulses having a low duty cycle, for providing pulses to turn on said constant current source means; and

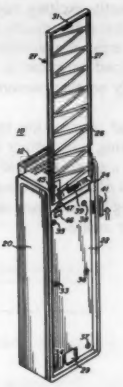
sample and hold circuit means coupled to said constant current source means such that the voltage output of said constant current source means is fed to said sample and hold circuit means, the latter being connected such that its output is connected to said comparator means.

4,313,119

DUAL MODE TRANSCEIVER ANTENNA

Oscar M. Garay, Hollywood, and Kazimierz Siwiak, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1980, Ser. No. 141,538
Int. Cl.[3] H01Q 1/24
U.S. Cl. 343—702 6 Claims



1. A dual mode antenna for a miniature radio transceiver comprising:

a U-shaped conductive antenna adapted to fit over a casing of the radio transceiver, wherein the U-shaped antenna is made of two separate segments spaced apart but disposed on the casing so that when the two are connected electrically they form the U-shaped antenna;

an impedance matching circuit coupled across the open end of the U-shaped antenna;

a dipole antenna element;

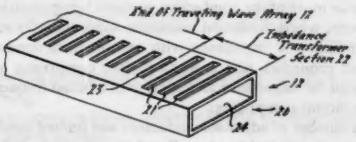
means for coupling the dipole antenna element in an extended position to de-couple one segment of the U-shaped antenna and couple the dipole antenna element and the other segment of the U-shaped antenna to the radio transceiver to provide a dipole antenna for the transceiver and coupling the dipole in a coupled position over the transceiver to complete electrical path between the two segments of the U-shaped antenna to form the U-shaped antenna to the transceiver and de-couple the dipole antenna from the transceiver to provide a loop antenna to the transceiver.

4,313,120

NON-DISSIPATIVE LOAD TERMINATION FOR TRAVELLING WAVE ARRAY ANTENNA

Charles W. Westerman, El Toro, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Continuation of Ser. No. 62,087, Jul. 30, 1979, abandoned. This application Sep. 5, 1980, Ser. No. 184,598
Int. Cl.[3] H01Q 13/10
U.S. Cl. 343—771 3 Claims



1. An antenna with a main beam comprising:

an apertured waveguide traveling wave array including a plurality of waveguide slots and a radiating load termina-

tion means for radiating electromagnetic energy in a direction parallel with said waveguide, said radiating load termination means being a radiating load termination for applying electromagnetic energy incident at the end of the antenna directly to the main beam of the antenna with the same polarization as the main beam so that gain of the antenna is improved, said apertured waveguide traveling wave array directly exciting said radiating load termination means so that substantially all input power into said traveling wave array is available for beam formation, and said radiating load termination being nondissipative so that substantially no electromagnetic energy is converted to heat,

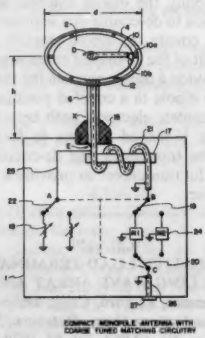
said radiating load termination including a quarter wave transformer having transformer slot means for impedance transforming in a section of said waveguide adjacent said waveguide slots of said traveling wave array, said waveguide slots being nonresonant and shorter in length than said transformer means.

4,313,121

COMPACT MONOPOLE ANTENNA WITH STRUCTURED TOP LOAD

Donn V. Campbell, Eatontown; Charles M. DeSantis, Neptune, and John R. Wills, Ocean Grove, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1980, Ser. No. 129,969
Int. Cl.³ H01Q *9/36*
U.S. Cl. 343—790 **7 Claims**



COMPACT MONOPOLE ANTENNA WITH COARSE TUNED MATCHING CIRCUITRY

1. A compact survivable VHF, monopole antenna with top fed capacitive top load having one or more conductive portions and one or more insulating portions, the antenna having a vertical element for supporting the said capacitive top load, one or more of the conductive portions being electrically fed at a point where feedpoint resistance approximately equals characteristic line impedance with one or more conductive portions grounded, said antenna further comprising a matching circuit for impedance matching over a broad frequency range, the circuit comprising:

a number of adjustable inductors and limited band matching units comprising broadband circuits each designed for a given portion of the band,

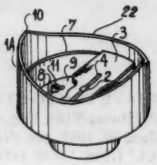
a positional switch manually operable to switch the individual matching units as required for a particular frequency.

4,313,122

OPEN CAVITY RADIATING SOURCE EXCITED BY A DIPOLE

Albert Dupressoir, and Claude Bloch, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 29, 1980, Ser. No. 116,549
Claims priority, application France, Feb. 2, 1979, 79 02767
Int. Cl.³ H01Q *9/16*
U.S. Cl. 343—818 **13 Claims**



1. A microwave radiator comprising:

a generally cup-shaped cavity with a cylindrical peripheral metal wall centered on an axis and an open end bounded by an edge with two diametrically opposite axial projections; and

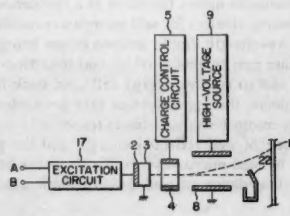
a diametrically extending dipole in said cavity, said projections being bisected by an axial plane perpendicular to said dipole.

4,313,123

CONTROLLABLE INK DROP VELOCITY TYPE INK-JET PRINTER

Koichiro Jinnai, Kawasaki; Masanori Horike, Yokohama; Kyuhachiro Iwasaki, Fujisawa, and Yutaka Kodama, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 48,170
Claims priority, application Japan, Jun. 21, 1978, 53-74172
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **2 Claims**



1. A deflection type ink-jet printer, comprising:

an ink drop generator for ejecting a stream of ink drops;

means for supplying ink to said generator;

velocity modulation means mounted on said generator for varying the velocity of ink drops ejected from said generator in accordance with the pulse width-pulse amplitude product of a pulsed excitation signal;

means for charging the ink drops ejected from said generator;

means for deflecting the ink drops charged by said charging means, the amount of deflection being dependent upon the velocity with which said ink drops are ejected from said generator, the amount of deflection therefore being dependent upon the pulse width-pulse amplitude product of said pulsed excitation signal;

signal generating means for generating said pulsed excitation signal and for varying the pulse width-pulse amplitude product of said signal in accordance with a desired ink drop print pattern; and

drop mass control means operatively associated with said signal generating means for varying the pulse width of said pulsed excitation signal in inverse relation with the amplitude thereof, so that the pulse width-pulse amplitude product thereof is substantially constant.

4,313,124

LIQUID JET RECORDING PROCESS AND LIQUID JET RECORDING HEAD

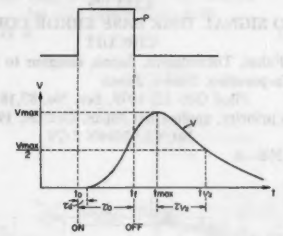
Toshitami Hara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,429

Claims priority, application Japan, May 18, 1979, 54/62079; Jun. 1, 1979, 54/68566; Jun. 1, 1979, 54/68567; Jun. 1, 1979, 54/68568; Jun. 1, 1979, 54/68569; Jul. 12, 1979, 54/88729

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **7 Claims**



1. A liquid jet recording process utilizing a recording head comprising, a liquid ejecting portion including an orifice for ejecting a liquid droplet and a heat actuating portion communicating with the orifice and contacting a heating surface adapted to apply heat energy for ejecting a liquid droplet to the liquid and an electrothermal transducer for generating heat energy which comprises: conducting the recording under a condition that an average value of a bubble volume changing ratio,(dV/dt)/Vmas is at least 5×10^3 sec^{-1},

where dV/dt is a change of the volume V of a bubble per unit time when the volume of bubble increases, the bubble being produced by the heat energy which is generated at the electrothermal transducer energized by an input electric signal and is applied to the liquid in the heat actuating portion, and Vmax is the maximum volume of the bubble.

4,313,125

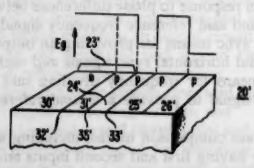
LIGHT EMITTING SEMICONDUCTOR DEVICES

Robert L. Hartman, Warren Township, Somerset County; Louis A. Koszi, Scotch Plains, and Norman E. Schumaker, Warren Township, Somerset County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 21, 1979, Ser. No. 50,637

Int. Cl.³ H01S *3/18, 3/19*

U.S. Cl. 357—17 **9 Claims**



1. In a semiconductor light emitting diode, a semiconductor body comprising:

an active region bounded in part by at least two isotype heterojunctions; and

a p-n junction located entirely exterior to, and entirely non-contiguous with said active region, but adapted to inject minority carriers therein when forward biased.

4,313,126

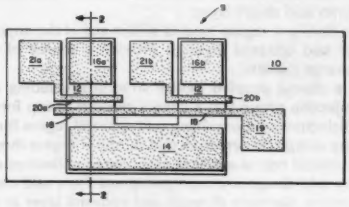
FIELD EFFECT TRANSISTOR

Charles F. Krumm, Thousand Oaks, Calif., and Robert A. Pucel, Needham, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 21, 1979, Ser. No. 41,156

Int. Cl.³ H01L *29/80*

U.S. Cl. 357—22 **2 Claims**



1. A field effect transistor, comprising:

(a) a semiconductor;

(b) a source electrode means in contact with such semiconductor for providing a source region for the transistor;

(c) a plurality of separate, electrically independent drain electrode means in contact with such semiconductor for providing a plurality of separate electrically independent drain regions for the transistor;

(d) a common gate electrode means for controlling a flow of carriers in the semiconductor between the source region and the plurality of separate, electrically independent, drain regions; and

(e) a plurality of separate, electrically independent, electrode means, each one being adapted to control a flow of carriers in the semiconductor between a corresponding one of the separate drain regions and the source region.

4,313,127

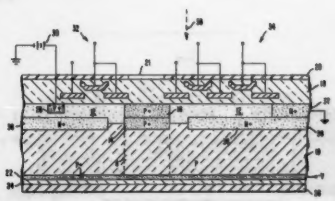
SIGNAL DETECTION METHOD FOR IR DETECTOR HAVING CHARGE READOUT STRUCTURE

Stephen C. Su, San Clemente, and Ronald M. Finnila, Carlsbad, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 6, 1980, Ser. No. 127,678

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **9 Claims**



9. A radiation detector of the semiconductor materials variety comprising:

(a) a p-type semiconductor substrate having an upper surface and a lower surface;

(b) a first p+ region adjacent a portion of said upper surface, said first p+ region forming a charge collection electrode

overlying a radiation detector region within the bulk of said substrate;

(c) a second p+ region adjacent said lower surface, said second p+ region forming a backside detector electrode, said detector region lying between said electrodes;

(d) an n-type epitaxial semiconductor region having an upper surface and a lower surface, said epitaxial region forming a layer that overlies the remaining portion of the upper surface of said subatrate and thereby surrounds said charge collection electrode;

(e) an n+ region forming a charge coupled device shield layer lying between said epitaxial layer and said substrate and having a window therein, said charge collection electrode being located within said window and spaced apart from said shield layer;

(f) a third p+ region located within and at the upper surface of said epitaxial layer to provide a source of minority charge carriers;

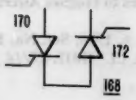
(g) a charge coupled device structure including a charge injection group and a charge readout group formed in a dielectric layer overlying said epitaxial region for advancing charge carriers from said third p+ region through said epitaxial region and into said charge collection electrode by said charge injection group and from said charge collection electrode through said epitaxial layer to a utilization circuit by said charge readout group; and

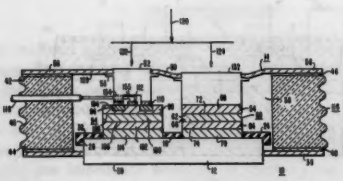
(h) a radiation shield layer overlying said dielectric layer and said charge coupled device structure contained formed therein, said shield layer having a detection aperture exposing a portion of said dielectric layer symmetrically overlying a portion of said charge collection electrode, thereby allowing incident radiation to reach the detector region after penetrating through the exposed portion of the said dielectric layer and the underlying portion of the said charge collection electrode.

4,313,128
COMPRESSION BONDED ELECTRONIC DEVICE COMPRISING A PLURALITY OF DISCRETE SEMICONDUCTOR DEVICES

Earl S. Schlegel, Plum Borough, and Derrick J. Page, Export, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 8, 1979, Ser. No. 37,090
Int. Cl.³ H01L *23/02, 23/12, 23/42*
U.S. Cl. 357—79 **8 Claims**





1. An electronic device comprising:

(a) a case member, said case member comprising a bottom member, a top member and a side member, said side member being joined to and extending between said bottom member and said top member, said bottom member, top member and side member forming a chamber, said top member of said case being comprised of a plate portion and pole portions,

(b) means associated with a surface of said bottom member disposed within said chamber for positioning a plurality of semiconductor devices upon said surface,

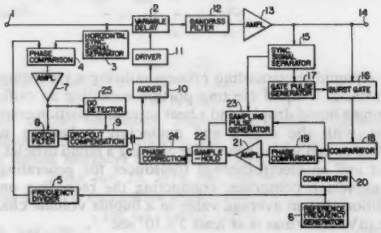
(c) a plurality of semiconductor devices disposed in predetermined positions upon the surface of said bottom member within said chamber,

(d) means comprising said pole portions of said top member distributing a compressive force, applied to said case member, to each of said plurality of semiconductor devices, there being a pole portion for each device, whereby said semiconductor devices are held in an electrical and thermal conductive relationship with portions of said case member and in an electrical circuit relationship with each other when the compressive force is applied to said case member.

4,313,129
VIDEO SIGNAL TIME BASE ERROR CORRECTION CIRCUIT

Tutomu Fukui, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Oct. 22, 1979, Ser. No. 87,181
Claims priority, application Japan, Oct. 26, 1978, 53-131979
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—8 **4 Claims**



1. A system for the correction of time base errors in video signals reproduced from a rotating record carrier, said reproduced video signals including burst signals and horizontal sync signals, said system comprising:

time base error correction means, including a variable delay line means, for receiving said reproduced video signals and for correcting time base errors in said video signals in response to a control signal, the output of said delay line means comprising corrected video signals;

a reference frequency generator circuit for generating a reference frequency signal;

phase detection means, including a phase detector circuit having first and second inputs and providing an output in accordance with a phase difference between said first and second inputs, for receiving said corrected video signals and said reference frequency signal and producing output signals in response to phase differences between said burst signals and said reference frequency signal;

horizontal sync means for providing an output corresponding to said horizontal sync signals and said video signals;

dividing means for frequency dividing said reference frequency signal to provide a second reference frequency signal;

second phase comparison means, including a second phase detector having first and second inputs and providing an output in accordance with a phase difference between said first and second inputs, for receiving the outputs of said horizontal sync means and said dividing means and providing an output signal in response to a phase difference therebetween;

dropout detecting means for detecting a dropout in the

output of said second phase detector due to a dropout of said horizontal sync signals, and for providing an output signal during the occurrence of a dropout;

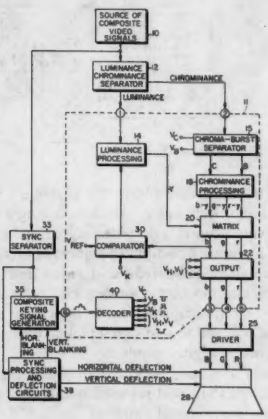
dropout compensating circuit means for correcting, in accordance with the output of said dropout detecting circuit, variations in the output of said second phase comparison means due to dropout; and

an adder circuit for summing the outputs of said first phase comparison means and said dropout compensating circuit means, an output of said adder circuit comprising said control signal to said time base error correction means.

4,313,130
KEYING SIGNAL GENERATOR WITH FALSE OUTPUT IMMUNITY

Thomas D. Yost, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1980, Ser. No. 182,753
Int. Cl.³ H04N *5/44, 9/46*
U.S. Cl. 358—21 R **14 Claims**



1. In a television receiver for processing a composite television signal containing image information occurring during periodic horizontal image intervals and horizontal synchronizing information occurring during periodic horizontal image blanking intervals; said receiver including means for providing a horizontal reference pulse representative of said horizontal synchronizing information; means for providing a horizontal timing signal comprising image and blanking interval components subject to synchronization by said horizontal synchronizing information; and keyed signal processing circuits; apparatus for generating an output keying signal during said blanking intervals, said apparatus comprising:

keyed means, subject to switching between first and second switching states and coupled to said horizontal reference pulse providing means, for generating said keying signal, said keyed means including an output circuit coupled to a circuit point and exhibiting said second switching state during each reference pulse appearance;

means for coupling keying signals from said circuit point to said keyed signal processing circuits; and

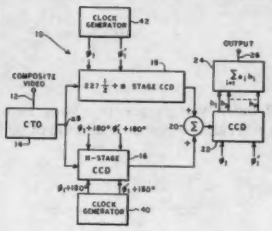
control means coupled to said circuit point and responsive to said horizontal timing signal for inhibiting false keying signal outputs from said keyed means during said image intervals, said control means exhibiting a nonconductive condition during said blanking intervals, and exhibiting a conductive condition during said image intervals; and wherein

the current conduction capability of said control means during said image intervals substantially equals or exceeds the current conduction capability of said output circuit of said keyed means.

4,313,131
CCD COMB FILTER AND DEMODULATOR

Ronald B. Lee, Skokie, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 8, 1980, Ser. No. 185,115
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—31 **9 Claims**



1. In a television receiver adapted to process a video signal having luminance components frequency-interleaved with color components modulated on a color subcarrier, a color demodulation and comb filtering system, comprising:

filter means for receiving the video signal and for filtering low frequency components therefrom;

a first charge coupled device coupled to the output of said filter means for delaying the signal received therefrom for an interval I and for converting the signal received therefrom to charge packets;

a second charge coupled device coupled to the output of said filter means for delaying the signal received therefrom for an interval corresponding to the sum of the interval I plus one horizontal line interval, and for converting the signal received therefrom to charge packets;

means for applying to said first and second charge coupled devices clock signals whose frequencies are equal to the frequency of the color subcarrier such that said first and second charge coupled devices develop output charge packets whose frequency spectra include luminance and color components at their baseband frequencies centered around multiples of the color subcarrier frequency; and

means for combining the charge packet outputs of said first and second charge coupled devices such that a resultant signal is obtained which includes baseband color components and substantially no baseband luminance components.

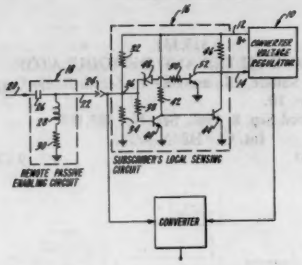
4,313,132
CABLE TV SECURITY MEANS

Glenn P. Doles, Wonder Lake, and James J. Beran, Cary, both of Ill., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed Oct. 31, 1979, Ser. No. 89,873
Int. Cl.³ H04N *7/16, 7/10;* **H04H** *1/00*
U.S. Cl. 358—114 **8 Claims**

1. In combination with a cable TV converter having a power supply, a passive enabling circuit adapted to be connected to the TV cable at a location remote from the converter and remote from the subscriber's premises, a sensing circuit connected to the TV cable at the converter cable input and to the converter power supply to provide power to said enabling circuit through the TV cable from the power supply, means in said sensing circuit controlling operation of said power supply

in accordance with the presence or absence of the enabling circuit, and said enabling circuit, when connected to said sens-



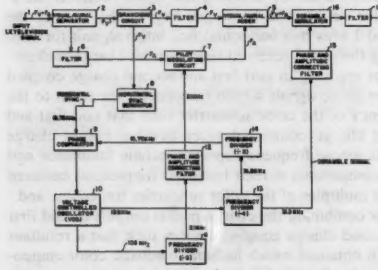
ing circuit and power supply, providing an input voltage at said sensing circuit to maintain operation of said power supply.

4,313,133

SCRAMBLING AND DESCRAMBLING SYSTEM IN CATV BROADCASTING SYSTEM

Jun Fukushima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 11, 1979, Ser. No. 74,489
Claims priority, application Japan, Sep. 13, 1978, 53-112836
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—118 **17 Claims**



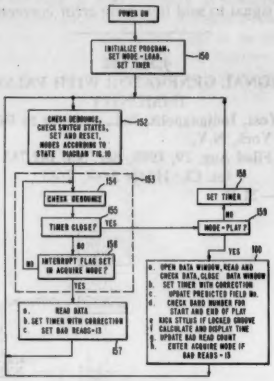
1. A scrambling and descrambling system in a CATV broadcasting system including transmitter apparatus in a CATV center and receiver apparatus in a terminal, said transmitter apparatus comprising means for modulating the aural signal in a TV signal by a pilot signal, and means for simultaneously modulating the modulated aural signal and a visual signal by a scramble signal having a frequency different from a frequency of the pilot signal and having a specific phase relationship to said pilot signal, and said receiver apparatus comprising means for detecting said pilot and scramble signals in said received input TV signal, means responsive to a descrambling signal for demodulating said input TV signal and generating a descrambled TV signal as an output, means responsive to the pilot signal for generating the descramble signal with a frequency and phase determined in response to the pilot signal, and means responsive to a residual scramble signal remaining in the descrambled TV signal for controlling the amplitude of the descramble signal to tend to reduce the magnitude of the residual scramble signal to zero.

4,313,134

TRACK ERROR CORRECTION SYSTEM AS FOR VIDEO DISC PLAYER

James C. Rustman, Indianapolis, and Michael J. Mindel, Camby, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,386
Int. Cl.³ H04N *5/76*; G11B *17/22, 3/82*
U.S. Cl. 358—728.5 **11 Claims**



1. In a video disc player for playing a video disc having signal tracks, said signal tracks recording a carrier modulated with a video signal, said video signal including signals representing a plurality of digital numbers in predetermined orderly sequence encoded therein, said video disc player including a signal pickup means for sensing said recorded video signal, a system for reducing tracking errors comprising:

means coupled to said signal pickup means for decoding said recorded digital numbers;

means for storing selected decoded digital numbers and incrementing said selected number on the occurrence of subsequent digital numbers;

means responsive to said decoded digital numbers and said incremented number for providing an error indication signal when consecutively decoded digital numbers disagree with the incremented stored digital number, wherein said error indication signal is indicative of a detected tracking error; and

means responsive to said error indication signal for moving said signal pickup means to other signal tracks recording said video signal in such direction as to overcome said detected tracking error.

4,313,135

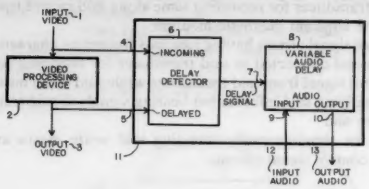
METHOD AND APPARATUS FOR PRESERVING OR RESTORING AUDIO TO VIDEO SYNCHRONIZATION

J. Carl Cooper, 1373 Sydney, Sunnyvale, Calif. 94087

Filed Jul. 28, 1980, Ser. No. 172,043
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—149 **13 Claims**

1. Apparatus for maintaining correct audio to video timing relationship in a television system, comprising a delay detec-

tion circuit to measure the delay through at least one external video device, and variable audio delay circuit controlled by



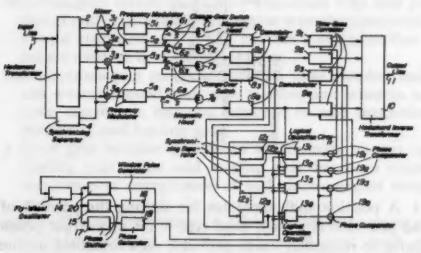
said delay detection circuit to provide an audio delay equal to the delay through said video device.

4,313,136

SYNCHRONIZING SIGNAL SEPARATION SYSTEM

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 119,116
Claims priority, application Japan, Feb. 13, 1979, 54-15332
Int. Cl.³ H04N *5/08*
U.S. Cl. 358—153 **3 Claims**



1. A synchronizing signal separation system for use with a tape playback system responsive to transformation signals, comprising a flywheel oscillator responsive to a synchronizing signal contained in a reproduced transformation signal, means responsive to the oscillator for simultaneously generating a window pulse output and a timing pulse output, logic means for utilizing the window pulse output and the synchronizing signal as a time-base correction signal and for utilizing the timing pulse output as a signal to be detected when a synchronizing signal is lacking.

4,313,137

INTEGRATABLE VERTICAL SYNC SEPARATOR

William R. Weissmueller, Wildwood, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed May 6, 1980, Ser. No. 147,414
Int. Cl.³ H04N *5/06*
U.S. Cl. 358—154 **14 Claims**

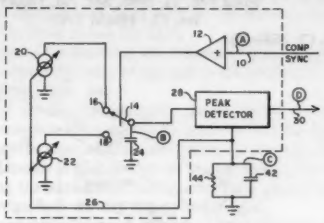
1. In a television receiver adapted to receive a composite signal which includes horizontal and vertical sync pulses, a vertical sync separator comprising:

a storage capacitor;

means responsive to composite sync pulses for alternately charging and discharging said capacitor such that the capacitor develops a relatively high level voltage when vertical sync pulses are received, and responsive to a feedback signal for altering the charge and discharge rates of said capacitor;

detector means responsive to the relatively high level voltage on the capacitor for developing a vertical sync output pulse and for producing a feedback signal indicative of the amplitude of the relatively high level voltage on the capacitor; and

means coupling the feedback signal to the charging and discharging means for varying the charge and discharge



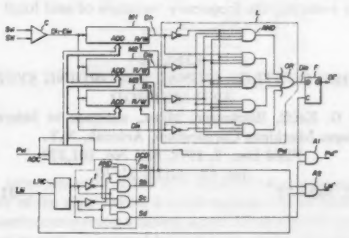
rates so that the relatively high level voltage on the capacitor tends to remain at a substantially constant value irrespective of the signal-to-noise ratio associated with the composite signal.

4,313,138

IMAGE INFORMATION READING SYSTEM OF FACSIMILE APPARATUS

Hajime Kanda, Ayase, and Takesada Hirose, Tokyo, both of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Mar. 17, 1980, Ser. No. 131,277
Claims priority, application Japan, Mar. 17, 1979, 54-30547
Int. Cl.³ H04H *1/40*
U.S. Cl. 358—280 **6 Claims**



1. An image information reading system comprising:

reading means for reading the image information of each information of each line by scanning the image of original a plurality of times within the time available for reading one line in the main scanning direction thereof;

memory means for successively storing the image information of each line which is output from said reading means;

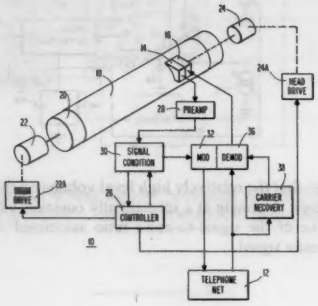
means for taking out simultaneously the image informationn of each scan so far stored from said memory means, in synchronization with the last scan of said image information by said reading means within said reading time; and

logic processing means for receiving thereto the image information obtained by said last scan and said image information taken out simultaneously from said memory and obtaining image information of said one line out of the image information of each scan obtained by said reading means.

4,313,139
CARRIER RECOVERY CIRCUIT FOR A FACSIMILE SYSTEM

James A. Logie, Orlando, Fla., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 11, 1980, Ser. No. 120,486
Int. Cl.[3] H04M *1/40*
U.S. Cl. 358—281 7 Claims



1. In a receiver for a facsimile system in which a local carrier is either derived from the carrier component of a modulated signal or is generated when that component is not detectable of the type having:

a means for detecting the transmitted carrier of said modulated signal;

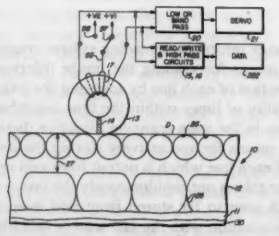
a first variable frequency oscillator means responsive to said detecting means, the frequency of which varies with and is phase locked in proportion with the frequency of said transmitted carrier when the transmitted carrier is detectable but which remains substantially constant and equal to the frequency of the last detected transmitted carrier when the transmitted carrier is no longer detectable, the improvement comprising:

a means responsive to said first variable frequency oscillator for reducing the frequency variation of said local carrier.

4,313,140
BURIED CONTROL SIGNAL RECORDING SYSTEMS AND METHOD

Steven D. Keidl, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1979, Ser. No. 101,379
Int. Cl.[3] G11B *21/10*
U.S. Cl. 360—77 31 Claims



1. A magnetic recorder having a single gap magnetic transducer adapted to exchange signals with an adjacent magnetic record medium along a record track being scanned by the transducer, said record medium having a deeply recorded control signal extending along said record track, said control signal being a narrow-band low-frequency signal,

the improvement including in combination:

information-bearing signal write means connected to said transducer for supplying information-bearing signals to said transducer for recording same along said record track on the adjacent magnetic medium;

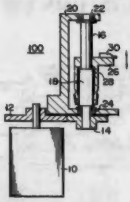
a control signal circuit having low pass frequency characteristics and connected to said transducer for receiving said control signal from said transducer while said write means is supplying said information-bearing signals to said transducer; and

means for simultaneously actuating said write means and said control signal circuit.

4,313,141
POSITION SHIFT APPARATUS

Seiichi Yanagida, Hiratsuka; Hisaharu Takeuchi, Kawasaki, and Masamitu Nishina, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 29, 1979, Ser. No. 98,691
Claims priority, application Japan, Nov. 30, 1978, 53/147273
Int. Cl.[3] G11B *5/55, 21/10*
U.S. Cl. 360—78 15 Claims



1. A position shift apparatus for shifting the position of a head provided in a fixed head type VTR to a target position relative to recording tracks provided on a recording medium, comprising:

actuator means on which said head is mounted for varying the position of said head, including

screw feeding or shaft movement means having first and second threaded portions meshingly engaged for varying the position of said head, one of said threaded portions adapted to be rotated to shift translationally the other of said threaded portions on which said head is mounted to shift the position of said head in dependence on the rotation and rotational direction of said one of said threaded portions;

control means for controlling said actuator means such that said one of said threaded portions is always rotating in a predetermined first direction immediately prior to said head being stopped on said target position upon varying of the position of said head, including

means for determining whether said head is displaced in a first direction or a second direction with respect to said target position,

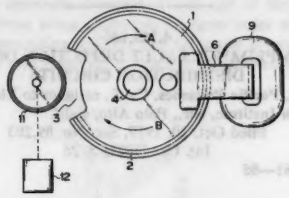
means for shifting said head in a first direction directly to said target position by selected directional rotation of said one of said threaded portions until said head reaches said target position when said head is displaced in the first direction with respect to said target position, and

means for shifting said head in a second direction opposite to the first direction by oppositely selected rotation of said one of said threaded portions when the head is displaced in the second direction with respect to said target position, said second direction shifting means including means for shifting said head in said second direction by a predetermined amount past said target position and means for then actuating said first direction shifting means to shift said head said predetermined amount in said first direction to stop said head at said target position.

4,313,142
MODE CHANGING APPARATUS FOR A TAPE RECORDER

Hiroyuki Uchida, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,535
Claims priority, application Japan, Oct. 25, 1978, 53/145786[U]
Int. Cl.³ G11B 5/54, 15/10, 15/24
U.S. Cl. 360—105 7 Claims

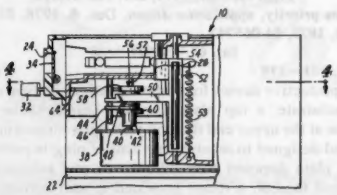


1. A mode changing apparatus adapted for use in a tape recorder comprising:
- a rotatably supported loading gear having at least a portion magnetized in N and S poles;
- electromagnet means operatively associated with said portion of said magnetized loading gear whereby energization of said electromagnet means induces a magnetic flux to impart rotation to said loading gear;
- said electromagnet means including a yoke member and a coil wound around said yoke member and wherein said yoke member is disposed adjacent to said magnetized portion of said loading gear;
- a drive gear member positioned to drivingly engage said loading gear when said loading gear has been rotated responsive to energization of said electromagnet means; and
- said loading gear including a toothed peripheral segment and a cutout segment without peripheral gear teeth and wherein said cutout segment is located adjacent said drive gear member when said electromagnet means is not engaged with said loading gear and wherein said toothed peripheral segment of said loading gear rotates into meshing engagement with said drive gear member upon energization of said electromagnet means.

4,313,143
HEAD POSITIONING MECHANISM FOR DATA CARTRIDGE RECORDER

Myron Zarr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Sep. 4, 1979, Ser. No. 72,228
Int. Cl.³ G11B 17/00
U.S. Cl. 360—106 6 Claims

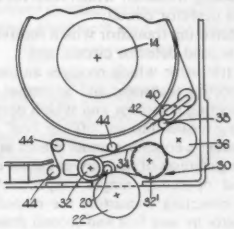


1. In a recorder adapted to receive data cartridges for incremental recording and playback of digital data on magnetic recording tape within the cartridge in which data is to be recorded and played back from a multiplicity of parallel tracks extending the length of the tape and in which a single record/playback head is adapted to interface with a tape driven along a transport path for the tape and to be variably positioned transversely with respect to the tape to enable the record and playback operations, a head positioning mechanism comprising
- (a) linear support means secured proximate to the transport path and perpendicular to the direction of tape motion,
- (b) head mounting means slideably mounted on the support means and adapted to receive the head for allowing linear travel of the head across the tape,
- (c) biasing means for directing the mounting means to move the head toward one edge of the tape in the absence of any counteracting force, and
- (d) means for driving the mounting means against the bias, thereby incrementally moving the head toward the opposite edge of the tape, and for controlling the motion of the mounting means as directed by the biasing means, thereby controlling the incremental movement of the head toward the first edge, said driving means including:
  - (i) a stepper motor secured relative to the transport path having a drive shaft rotatably mounted therein,
  - (ii) lead screw means mounted to the drive shaft of the stepper motor for converting rotary motion of the shaft into a corresponding linear movement, and
  - (iii) means coupled to the lead screw for coupling the linear movement thereof to the head mounting means.

4,313,144
TAPE CASSETTE HAVING INTERNAL DRIVE WITH SPEED ADJUSTMENT

Anthony B. Waddington, 20 Bartok House, 30 Lansdowne Walk, London, W.11, England

Filed Nov. 15, 1979, Ser. No. 94,687
Claims priority, application United Kingdom, Nov. 16, 1978, 44864/78; Jul. 12, 1979, 7924412/79
Int. Cl.³ G11B 15/28, 15/44, 23/04
U.S. Cl. 360—132 25 Claims



1. A tape cassette for use in a cassette-type magnetic tape recorder of the type having a drive capstan and an erase head, said cassette comprising a casing, a pair of tape spools rotatably mounted in said casing and having a magnetic recording tape wound thereon, means in said casing for guiding said magnetic recording tape in a path extending adjacent one side edge of said casing, two drive capstan holes formed in said casing adjacent said side edge and located symmetrically about a mid-point of said edge whereby engagement of said cassette in a tape recorder locates the drive capstan of the tape recorder in one of said capstan holes for enabling the drive capstan to drive said tape in a first direction along said path from one of said spools to the other and inversion of said cassette locates the drive capstan in the other of said capstan holes for enabling the drive capstan in the other of said capstan holes for enabling the drive capstan to drive said tape in a second and reverse direction along said path, respective opening means in said one side edge adjacent each said drive capstan hole for engagement therein of the erasehead of the tape recorder, and a respective drive system located in said casing adjacent each of said drive capstan holes in engagement with said tape for transmitting drive from the drive capstan to said tape to drive said tape at

a speed which is higher or lower than the speed at which said tape would be driven by the drive capstan alone and wherein each drive system is adapted to enable engagement of the erase head into the adjacent opening means in said one side edge.

4,313,145

POWER OUTPUT CIRCUIT

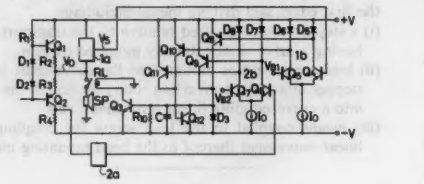
Masanori Ienaka; Masahiro Yamamura, both of Kodaira; Kazuo Watanabe, and Yasuo Kominami, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,657

Claims priority, application Japan, Oct. 20, 1978, 53-128368

Int. Cl.³ H02H *7/20*

U.S. Cl. 361—79 **2 Claims**



1. A power output circuit comprising:

load means to be driven by an output of said power output circuit;

switching means connected between said output of said power output circuit and said load means;

a first detector circuit for detecting a first operating status of said power output circuit;

a second detector circuit for detecting a second operating status of said power output circuit;

a first detecting transistor which receives an output signal of said first detector circuit;

a second detecting transistor which receives an output signal of said second detector circuit; and

a driving transistor which receives an output signal of said first detecting transistor and an output signal of said second detecting transistor and which operates to drive said switching means into an "off" or "on" state;

wherein under a condition under which said first and second operating statuses of said power output circuit lie in predetermined operating ranges respectively, said first and second detecting transistors are respectively biased into "on" states by said first and second detector circuits so as to permit predetermined currents to flow therethrough, and further, said driving transistor is controlled into an "on" state by said output signals of said first and second detecting transistors so as to drive said switching means into the "on" state, said power output circuit further comprising:

a first reference transistor which is connected with said first detecting transistor in a differential manner;

a second reference transistor which is connected with said second detecting transistor in a differential manner;

a first constant-current source which is connected to an emitter of said first detecting transistor and an emitter of said first reference transistor;

a second constant-current source which is connected to an emitter of said second detecting transistor and an emitter of said second reference transistor;

a protective transistor whose collector and emitter are respectively connected to a base and an emitter of said driving transistor;

a first group of controlling transistors whose base-emitter junctions have collector signals of said first and second detecting transistors applied thereto and whose collectors are connected to said base of said driving transistor in common; and

a second group of controlling transistors whose base-emitter junctions have collector signals of said first and second detecting transistors applied thereto and whose collectors are connected to a base of said protective transistor in common;

wherein when said first operating status or said second operating status of said power output circuit has fallen outside the predetermined operating range, said protective transistor is controlled into an "on" state by collector signals of said second group of controlling transistors so as to control said driving transistor into an "off" state.

4,313,146

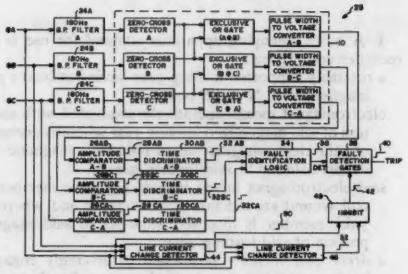
HIGH IMPEDANCE FAULT DETECTION ON POWER DISTRIBUTION CIRCUITS

Ilyoul Lee, Pacific Palisades, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 29, 1979, Ser. No. 89,203

Int. Cl.³ H02H *3/26*

U.S. Cl. 361—85 **13 Claims**



1. A device for use in detecting high impedance faults on a solidly grounded, wye connected three-phase distribution circuit, said device comprising means for sensing the third harmonic current component in each three-phase line current of said distribution circuit including the phase of each of said current components relative to the others, and means connected with said current component sensing means for sensing a change in the phase of any one of said components during a period when the phases of the other of said components remain unchanged.

4,313,147

PROTECTIVE DEVICE FOR COMMUNICATION SYSTEM

Susumu Uchida; Shigeo Yamamoto, and Tsutomu Wadaki, all of Sagamihara, Japan, assignors to Kabushiki Kaisha Sankosah, Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,699

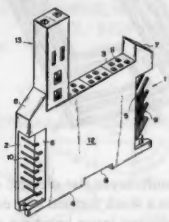
Claims priority, application Japan, Dec. 6, 1978, 53-167068; May 18, 1979, 54-065742

Int. Cl.³ H02H *3/22*

U.S. Cl. 361—119 **6 Claims**

1. A protective device for communication systems, comprising a substrate, a top plate disposed perpendicular to said substrate at the upper end thereof, jack holes formed in said top plate and designed to receive terminals of plug-in protectors, a bottom plate disposed perpendicular to said substrate at the lower end thereof, a recess provided in said bottom plate, a both-side printed substrate comprising outside line terminals arranged at one end thereof, outside line side contact pieces disposed at the upper end thereof and connected to the respective outside line terminals, interior line terminals arranged at the other end thereof, interior line side contact pieces disposed at the upper end thereof and connected to the respective interior line terminals, and a grounding contact piece disposed at

the upper end thereof and a ground terminal disposed at the lower end thereof and connected to said grounding contact piece, a contactor frame disposed on the underside of said top plate and comprising contactor holes formed in alignment with said respective jack holes in said top plate and contactors disposed in said respective contactor holes and arranged such that the contact pieces at the upper end of said both-side printed substrate are electrically connected from the lower side thereof, a cover adapted to enclose said substrate, the outside line terminals disposed at one end of the both-side printed substrate being arrayed in the same order as the array of the corresponding interior line terminals disposed at the other end of said substrate, contact strips adapted detachably



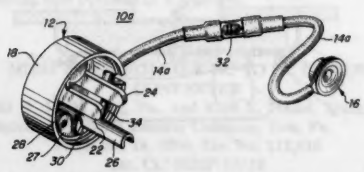
to enclose the outside and interior line side contactor holes in the contactor frame, said contact strips being arranged such that when they are mounted, the contactors in the outside line side contactor holes are connected to the corresponding contactors in the interior line side contactor holes through said contact strips, and when plug-in protectors are set in position, the contactors in the outside line side contactor holes are connected to the corresponding contactors in the interior line side contactor holes through said plug-in protectors, and when said contact strips are removed and plug-in protectors are mounted in position, the contactors in the outside line side contactor holes are connected to the corresponding contactors in the interior line side contactor holes through said plug-in protectors.

4,313,148

GROUNDING APPARATUS

Robert B. Turner, 28 Courtfield Dr., Brockton, Mass. 02401

Filed Apr. 21, 1980, Ser. No. 142,437
Int. Cl.³ H01H *1/04*
U.S. Cl. 361—212 **4 Claims**



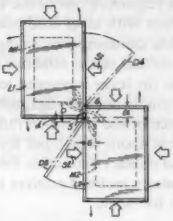
1. A grounding apparatus comprising: an electric plug for engaging with a conventional electrical receptacle having a conventional grounding contact and two energized contacts, said plug including a grounding lug for engaging said grounding contact and two dummy lugs for engaging the energized contacts of the receptacle; conductor means for connection at one end with a device to be grounded; and means in said plug for interconnecting the other end of said conductor means with said grounding lug.

4,313,149

ELECTRONIC EQUIPMENT ENCLOSURE CONNECTING STRUCTURE

Yoshinao Hirose, Kawasaki; Haruhiko Yamamoto, Yokohama; Keizo Suzuki, Tokyo; Isao Fukuchi, and Masahiro Tsuchiya, both of Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1980, Ser. No. 153,677
Claims priority, application Japan, Aug. 6, 1979, 54-72050
Int. Cl.³ H05K *7/02*
U.S. Cl. 361—394 **6 Claims**



1. An electronic equipment enclosure connecting structure which connects electronic equipment units, the electronic equipment units being electrically connected to each other by an interconnecting cable, said electronic equipment enclosure connecting structure comprising

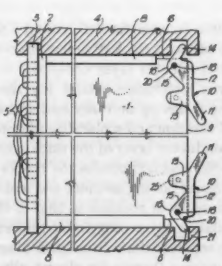
at least two enclosures, each accommodating an electronic equipment unit and each having a plurality of sides and a plurality of corners, said enclosures abutting each other at an overlap portion of a side of each next-adjacent a corner thereof and being connected to each other at the corner overlap portion of each, the interconnecting cable passing through the corner overlap portions and thereby connecting the electronic equipment units in a minimum distance.

4,313,150

LATCHING LEVER FOR PRINTED CIRCUIT BOARDS

Pak-Jong Chu, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 24, 1979, Ser. No. 78,016
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—399 **8 Claims**



1. In combination, a support frame, a rectangular circuit card, and a pair of latching levers, the circuit card having opposite side edges slidably engaging a first pair of vertically spaced rails extending horizontally into the frame, the circuit card having a rear edge supporting first connection means adapted for electrical interconnection with vertically arranged second connection means supported at the rear of the frame, the frame further including a pair of horizontally-extending U section rails extending perpendicularly to the first pair of rails and mounted at the front of the frame, the latching levers

rotatably mounted adjacent opposite front corners of the circuit card, each lever engageable with a respective one of the U section rails, and comprising a one-piece plastic molding having a U section base part including a spine from which extend a pair of walls, first facing portions of the walls having means for rotatably mounting the circuit card therebetween, second facing portions of the walls having facing projections snap locatable within an aperture in the circuit card to resiliently latch the lever when the card is fully inserted into the frame, and a camming part consisting of extensions of the walls at one end of the base part, said camming part tapering away from the circuit card mounting point, the camming part pivotally engageable within a respective one of the U section rails to function as a lever pivot with lever load being at the circuit card mounting point, the camming part engageable with one inside surface of the U section rail to establish a first pivotal engagement about which the lever is pivoted to overcome an electrical contact insertion force, and engageable with an oppositely facing inner surface of the U section rail to establish a second pivotal engagement about which the lever is pivoted to overcome an electrical contact extraction force, and a handle integral with an angularly inclined relative to the spine on the far side thereof from the walls.

4,313,151

FLAT ELECTRIC COIL WITH TAP

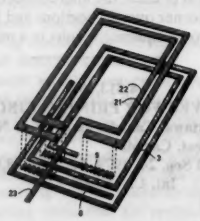
Roger A. Vranken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,691

Claims priority, application Netherlands, Jan. 12, 1979, 7900245

Int. Cl.³ H05K *1/16*; H01F *5/00*

U.S. Cl. 361—402 **10 Claims**



1. A flat multi-layer electric coil having a tap comprising, a substrate which carries a stack of at least two conductor layers in which a first conductor layer comprises a system of single spiral-like electric conductor tracks together constituting a multiple first spiral having an outer end and an inner end and a given sense of rotation and a plurality of connection conductors, a second conductor layer of the stack comprising a system of single spiral-like electric conductor tracks together constituting a second spiral having an inner end and an outer end and having the same sense of rotation as that of the first spiral, an electrically insulating layer interposed between adjacent conductor layers to separate them from each other, said insulating layer having windows therein for electrically interconnecting the adjacent conductor layers, the single conductor tracks of the second spiral being interrupted in places which are situated in a line, in which places the ends of the conductor tracks are interconnected on either side of the interruption via the windows in the electrically insulating layer and the connection conductors in the first conductor layer, means interconnecting the inner ends of the first and second spirals, and a conductor providing a lead out for the inner end of the second spiral so as to form a tap on the coil in which the conductor extends between the interruptions.

4,313,152

FLAT ELECTRIC COIL

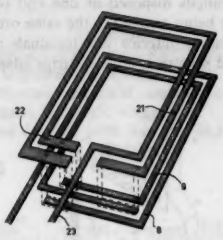
Roger A. Vranken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,283

Claims priority, application Netherlands, Jan. 12, 1979, 7900244

Int. Cl.³ H05K *1/16*; H01F *5/00*

U.S. Cl. 361—402 **9 Claims**



1. A miniaturized multi-layer flat electric coil comprising a substrate which carries a stack formed of a number of conductor layers, a first conductor layer having a number n of conductor tracks each forming a single spiral having an inner end and an outer end, the n^{th} spiral being situated within the n-1^{st} spiral, a second conductor layer having a number n of conductor tracks each forming a single spiral having an inner end and an outer end, the n^{th} spiral being also situated within the n-1^{st} spiral, and an electrically insulating layer having windows and interposed between the first and second conductor layers to separate said conductor layers from each other, said windows being located to provide electric interconnections between the adjacent first and second conductor layers such that the single spirals of the first and second conductor layers are interconnected to form one multiple spiral having a uniform sense of rotation in which successive single spirals are situated alternately in the first and in the second conductor layer.

4,313,153

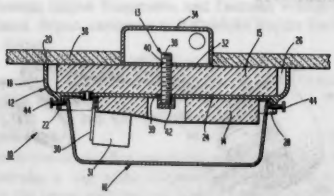
PAN-TYPE LIGHTING FIXTURE

George O. Davis, Brea, Calif., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 29, 1980, Ser. No. 182,681

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—184 **8 Claims**



1. A pan-type lighting fixture for mounting in association with an outlet box positioned in a ceiling, said fixture being characterized by a heat-dissipating base having a thermal conductivity, k, in excess of 0.4 calories per cm. per sec. per °C., said base having a generally vertical sidewall section and a generally horizontal, planar intermediate wall disposed between opposed ends of the sidewall section, said horizontal wall dividing the base into upper and lower compartments; at least one socket being secured to the fixture through mounting means connected to the horizontal wall and positioned in the

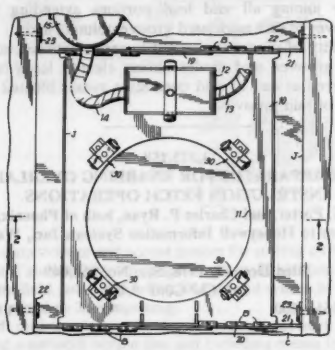
lower compartment; a layer of insulating material disposed in the lower compartment between the sockets and the horizontal wall and a layer of insulating material disposed in the upper compartment; a mounting stud including a threaded heat-insulating plastic stem passing through a central opening in the horizontal wall of the base for connection with a threaded opening associated with the outlet box, said fixture complying with the UL temperature limit of 60° C.

4,313,154

LIGHTING FIXTURE WITH UNIFORM MOUNTING FRAME FOR NEW INSTALLATIONS

Joseph A. Capostagno, Somerset, Mass.; Kingsley Chan, Rutherford, and Alexandre Kartavenko, Bayonne, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed May 8, 1980, Ser. No. 147,852
Int. Cl.³ F21S *1/06*
U.S. Cl. 362—365 **7 Claims**



1. A universal ceiling lighting fixture for supporting reflectors of a variety of sizes comprising a frame, means on said frame for securing the same above a ceiling structure, a reflector receiver aperture formed in said frame, a plurality of adjustable reflector mounting assemblies on said frame in angularly offset positions surrounding and adjacent said aperture, each said mounting assembly comprising a pivot member extending normal to said frame and spaced from the edge of said aperture by a first distance, and a connector member rotatably mounted on said pivot means, said connector member including at least two connector arms having distal end portions spaced from said pivot member by second and third distances, respectively, both said second and third distances having a horizontal component greater than said first distance, selected said arms being adapted to be disposed in registry with said aperture, and gripper means on said distal ends of said arms for engaging and supporting side portions of a reflector.

4,313,155

HIGH INPUT VOLTAGE DC TO DC POWER CONVERTER

Donald D. Bock, Erie, Pa., and Kurt K. Hedel, Utica, N.Y., assignors to General Electric Company, Erie, Pa.

Filed Jan. 14, 1980, Ser. No. 111,616
Int. Cl.³ H02P *13/18*
U.S. Cl. 363—21 **5 Claims**

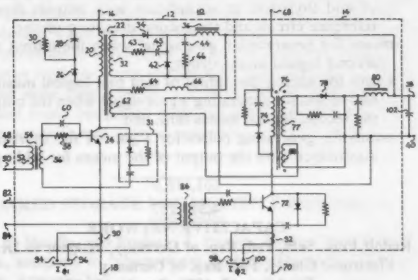
1. Voltage conversion apparatus for converting a first DC voltage of high magnitude between a pair of input power buses to a second DC voltage between a pair of output power buses, said apparatus comprising:

a. a plurality of staggered-mode DC to DC converters, each of said converters including first and second independent conversion units sharing a common pair of power output terminals, with each of said units comprising first and second power input terminals, a relatively low voltage power switching device having alternative conducting and non-conducting states, control terminals coupled to said switching device, a power transformer having primary and secondary windings, said primary winding being serially connected with said switching device between said input terminals, and rectifying means for connecting said secondary winding to the pair of power output terminals of the associated converter so that the output current from that converter is unidirectional;

b. means for connecting said power input terminals of the first conversion units of all of said plurality of converters in a first series string between the input power buses;

c. means for connecting said power input terminals of the second conversion units of all of said plurality of converters in a second series string between the input power buses, said second string being separate from said first string;

d. a plurality of equal value voltage dividing capacitors, half of said capacitors being respectively connected across the power input terminals of the conversion units forming said first string and the other half of said capacitors being



respectively connected across the power input terminals of the conversion units forming said second string;

e. means for connecting the pairs of power output terminals of all of said plurality of converters in parallel to the output power buses, whereby the output buses are supplied with the sum of the output currents from said converters;

f. a filter capacitor connected between said output power buses; and

g. control means connected to the control terminals of said first and second conversion units of all of said converters for simultaneously applying to the control terminals of said first units a first periodic state-changing signal that causes the respective switching devices of said first units to be in conducting states during predetermined intermittent intervals and for simultaneously applying to the control terminals of said second units a second periodic state-changing signal that causes the respective switching devices of said second units to be in conducting states during intervals that are staggered with respect to said predetermined intermittent intervals.

4,313,156

GATE CONTROLLING CIRCUIT FOR A THYRISTOR CONVERTER

Sumio Kobayashi, Yokohama; Tadashi Takahashi, Kawasaki, and Hidetoshi Ino, Kunitachi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 5, 1979, Ser. No. 82,339
Claims priority, application Japan, Dec. 22, 1978, 53-157643
Int. Cl.³ H02H *7/125*
U.S. Cl. 363—54 **4 Claims**

1. A gate controlling circuit for a thyristor converter which

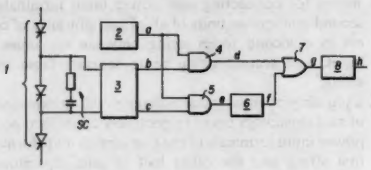
has a plurality of series-connected thyristors, said circuit comprising:

a reference circuit for commanding said thyristors in accordance with a predetermined sequence;

first detecting means for detecting the forward bias voltage of at least one of said thyristors;

second detecting means for detecting the inverse voltage of at least one of said thyristors;

first logical means for generating a gate signal for the gate of said thyristors in accordance with outputs from the reference circuit and the first detecting means;



second logical means for generating a gate signal for the gate of said thyristors in accordance with outputs from the reference circuit and the second detecting means,

means for generating a gate signal when the output of the second logical means drops;

means for adding the output of said first logical means and said means for generating a gate signal when the output of the second logical means falls; and

means for generating pulses for a gate of the thyristors in accordance with the output of the means for adding.

4,313,157

CAPACITIVE NETWORK

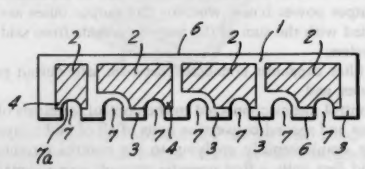
Rudolf Fink, Selb, Fed. Rep. of Germany, assignor to Draloric Electronic GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,270

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841742

Int. Cl.³ H01G 4/40

U.S. Cl. 363—59 **16 Claims**



1. A capacitive network comprising:

a plurality of dielectric layers stacked facewise atop one another, each of said dielectric layers being comprised of a thin plate of dielectric material, said plate having edges;

a series of grooves formed along at least one said edge of each of said dielectric layers, each of said grooves including a base portion opposite said one edge; said dielectric layers being shaped and relatively positioned so that a respective said groove of each said dielectric layer is aligned with the same respective said groove of all other said dielectric layers such that a plurality of groove columns are formed;

a row of metal layers being supported on each said dielectric layer; said metal layers being arrayed and spaced apart along the same direction as said grooves; each said metal layers including a lead portion thereof extending to a respective said groove that is adjacent that said metal layer on said dielectric layer; said metal layers being shaped, spaced and positioned so that a respective said lead portion extends to only one of one set of alternate ones of said grooves; said metal layers being supported on their respective said dielectric layers such that between a said dielectric layer and its adjacent said dielectric layers, said dielectric material is interposed between the said metal layers on adjacent said dielectric layers;

the respective said metal layers of adjacent said dielectric layers being placed so that said metal layers of adjacent said dielectric layers have overlapping surface areas and said metal layers being so placed that said lead portions of said metal layers of one said dielectric layer extend to a first set of alternate grooves and said lead portions of said metal layers of the adjacent said dielectric layer extend to a second alternate set of said grooves, wherein each said groove of said second set is between a respective pair of grooves of said first set of said alternate grooves;

a plurality of conductor means each associated with a respective one of said groove columns, each said conductor means located in its associated groove column and extending across said base portion of said grooves and electrically joining all said lead portions extending to the grooves of said associated groove column; and

a plurality of diodes connected in series between adjacent said grooves, said diodes having electric leads that are soldered at and to said conductor means located at the base of said grooves.

4,313,158

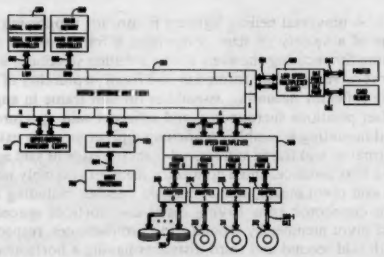
CACHE APPARATUS FOR ENABLING OVERLAP OF INSTRUCTION FETCH OPERATIONS

Marion G. Porter, and Charles P. Ryan, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 11, 1978, Ser. No. 968,049

Int. Cl.³ G06F 9/00

U.S. Cl. 364—200 **34 Claims**



1. A cache unit for use with a data processing unit for providing fast access to data and instruction words fetched from a main store coupled to said cache unit in response to commands received from said data processing unit, said cache unit comprising:

an instruction buffer coupled to said main store and having a plurality of addressable locations for storing sequences of said instruction words;

bistable instruction indicator means for storing a group of indicators corresponding in number to at least the maximum number of a predetermined type of read commands which can be in process at any one time; and,

control means coupled to said indicator means, to said processing unit and to said instruction buffer, said control means including first means operative in response to each predetermined type of read command received from said processing unit to generate signals for switching one of said indicators of said group associated with said received predetermined type of read command from a first state to a second state simultaneous with switching the remaining indicators of said group to said first state and said control

means further including second means coupled to said indicator means and to said instruction buffer, said second means being conditioned by said indicators for enabling said instruction buffer for writing therein only those instruction words transferred to said cache unit in response to a last one of said predetermined type of read command received from said processing unit as defined by the states of said group of indicators.

4,313,159

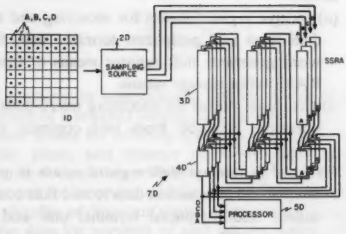
DATA STORAGE AND ACCESS APPARATUS

Stephen D. Shoap, Quincy, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 21, 1979, Ser. No. 13,711

Int. Cl.³ G06F *13/00*; G11C *19/00, 21/00*

U.S. Cl. 364—200 **23 Claims**



1. A data storage and access system for storing an N element data field and for providing access to an M element subset of said data field, where M is less than N and where M is greater than or equal to 2, comprising:

a shift register element having N stages, a network input line and a network output line and including means for shifting data from stage-to-stage therein in response to a first clock signal,

wherein M of the stages of said shift register element are S/A SRA shift registers which are interconnected to provide a closed data loop, and include means for shifting data from register-to-register fully around said closed S/A SRA shift register loop in response to a second clock signal, to periods between shifts in response to said first clock signal, said data shifting means being selectively operative when said subset of said data field is stored in said S/A SRA shift registers, and

a system output line coupled to one of said S/A SRA shift registers in said loop whereby said subset of said data field is serially provided in response to said second clock signal.

4,313,160

DISTRIBUTED INPUT/OUTPUT CONTROLLER SYSTEM

Phillip A. Kaufman, Irvine; Jerry R. Washburn, Alhambra, and Paul A. Stapinski, Mission Viejo, all of Calif., assignors to Computer Automation, Inc., Irvine, Calif.

Continuation of Ser. No. 715,174, Aug. 17, 1976, abandoned. This application May 1, 1979, Ser. No. 35,263

Int. Cl.³ G06F *3/00, 13/00*

U.S. Cl. 364—260 **16 Claims**

1. A distributed input/output control system adapted for use with a digital computer and a plurality of peripheral units, the computer having a main memory unit and a central processor unit, the system comprising:

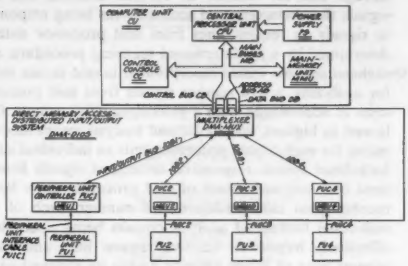
a first multiplexer adapted to be connected to said computer for communicating with said main memory unit by means of said central processor unit;

a first plurality of peripheral-unit controllers, each such controller coupling at least one of a first plurality of peripheral units with said first multiplexer;

a second multiplexer adapted to be connected to said computer and also adapted to communicate directly with said main memory unit without processing in said main processor unit;

a second plurality of peripheral-unit controllers, each such controller coupling at least one of a second plurality of peripheral units with said second multiplexer; and

means for establishing priority relationships among each said



plurality of peripheral-unit controllers and for establishing a priority relationship between said first and second multiplexers whereby an ordered sequence of input/output operations is established for any plurality of peripheral units ready to communicate with said computer at about the same time whereby transfers may be made between said ready peripheral units and said computer in accordance with said ordered sequence.

4,313,161

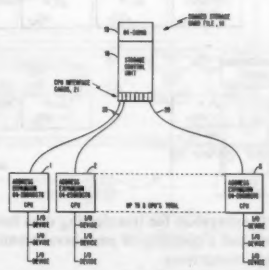
SHARED STORAGE FOR MULTIPLE PROCESSOR SYSTEMS

Dick K. Hardin, and Frederic J. Puttlitz, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,643

Int. Cl.³ G06F *9/38, 15/16*

U.S. Cl. 364—200 **14 Claims**



1. A shared storage arrangement for a data processing system, comprising:

a set of a predetermined number of processor units, each of said processor units having facilities for processing data in accordance with programmed instruction sequences and for generating request signals indicative of the need to access shared storage for data transfer operations;

at least one common shared storage unit, said storage unit storing data processing information in a plurality of addressable locations;

a storage control unit interconnected with said shared storage unit for controlling access to data in the addressable locations in said shared storage unit;

individual processor interconnect means respectively associated with each of said processor units and activatable to

interconnect said processor unit with said storage control unit;

access means associated with said storage control unit, said access means being responsive to request signals from said processor units to selectively activate said processor interconnect means and thereby interconnect a selected processor unit through said storage control unit to said shared storage unit for transfer of control, address, and data signals therebetween, said access means being responsive to signals on request lines from said processor units as determined by a predetermined scanning procedure; and

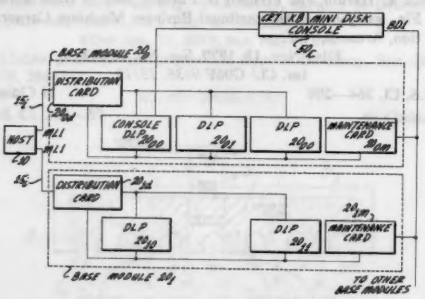
lookahead analysis means incorporated in said access means for analyzing active request signals from said processor units in accordance with a prioritized arrangement from lowest to highest, said lookahead analysis means incorporating for each of said processor units an individual subset lookahead circuit responsive to request signals from at least one assigned subset of said processor units less in number than said predetermined number, each of said individual lookahead analysis circuits being operable to effectively bypass all inactive request lines and active request lines of lower priority within its assigned subset and to provide a substantially immediate accept signal to activate the processor interconnect means for any requesting processor having highest priority in the subset.

4,313,162

I/O SUBSYSTEM USING DATA LINK PROCESSORS

Kenneth W. Baun, El Toro, and Donald A. Millers, II, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 14, 1979, Ser. No. 103,739
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **11 Claims**



1. In an I/O subsystem for transferring data between a main host computer and a plurality of peripheral terminal units, the I/O subsystem comprising:

(a) a message level interface bus connecting said host computer to a base module;

(b) a base module which includes:

(b1) a common backplane connecting a plurality of data link processors;

(b2) a distribution control cirucit card for controlling the connection and disconnection of selected data link processors said distribution control circuit card being connected to said common backplane and functioning to connect a selected data link processor to said host computer for transmission of stored data received from a peripheral unit or to receive and store data from said host computer for transmission to said peripheral unit;

(b3) said plurality of data link processors each having a separate connection to individual peripheral terminal units, each of said data link processors including:

(b3a) common control circuit means which include:

(i) PROM control storage means for storing individually addressable micro-code word operators;

(ii) pipeline register means to store and convey an accessed word operator to a peripheral dependent circuit means for execution;

(iii) sequencing means to select address sources for said PROM control storage means;

(iv) RAM buffer storage means for temporarily holding data to be transferred between said host computer and a selected peripheral terminal unit said buffer storage means connected to said peripheral dependent circuit means and functioning to receive data from said peripheral terminal unit or to send stored data to said peripheral terminal unit;

(b3b) peripheral dependent circuit means which include:

(o) receive register means for receiving and storing data from said peripheral terminal unit, from a word generator shift register means or from said RAM buffer storage means;

(i) first logic means for executing micro-code word operators received from said common control circuit card;

(ii) word generation shift register means to provide control and information data to said host computer and/or said peripheral terminal unit said word generator shift register means receiving instruction signals from said common control circuit card and functioning to formulate: completion/incompletion signals for each I/O task, codes to instruct and control said peripheral terminal unit, and identification signals for said host computer;

(iii) means for selecting a source of data to be stored in said RAM buffer storage means said means connected to said first logic means and receiving instruction signals to select, as a data source, the said peripheral terminal unit, the said main host computer, or said RAM buffer storage means;

(iv) address logic means for formulating addresses for the reading-out and writing-in of data in said RAM buffer storage means said address logic means connected to receive micro-code word signals from said pipeline register means and to select addresses from the source of data selected by said means for selecting a source;

(b4) a maintenance circuit card for selective testing of individual data link processors said maintenance circuit card connected to each of said data link processors via said common backplane and having a connection line to said distribution control circuit card, said connection line functioning to prevent data transfer operations in any data link processor undergoing maintenance testing;

(b5) a console data link processor connecting to a console unit;

(c) a console unit for maintenance checking of the I/O subsystem which includes:

(c1) a microprocessor for operating test routines;

(c2) a floppy disk connecting to said microprocessor for program storage of test routines;

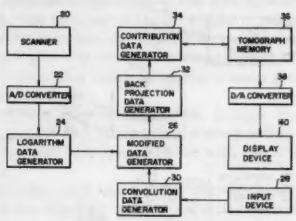
(c3) connection means to said console data link processor;

(d) a plurality of peripheral terminal units, each of which has individual connection means to the peripheral dependent circuit means of its associated data link processor.

4,313,163
APPARATUS FOR CONTROLLING A TOMOGRAPH DISPLAY

Hiroyuki Mizutani, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 16, 1980, Ser. No. 112,453
Claims priority, application Japan, Jan. 22, 1979, 54-4760
Int. Cl.[3] G01J 23/00
U.S. Cl. 364—414 9 Claims



1. Apparatus for controlling a display device to display a tomograph of a selected subject, comprising:

scanner means for orbitally scanning said subject in a specific plane, said scanner means including a radiation source for emitting a fan-shaped X-ray beam and a detector unit for receiving said fan-shaped beam and producing a plurality of detection signals representing X-ray absorption data for portions of said subject within said beam, each of said detection signals being generated by a narrow beam segment of said fan-shaped beam;

means for converting said detection signals into back-projection signals representing X-ray absorption data which is back-projected onto a reference line in said specific plane according to the distance between said radiation source and said reference line; and

means for obtaining, according to the distance between said radiation source and said reference line and the distance between said reference line and a given point of the subject within said specific plane, output data signals each representing the contribution of said back-projection signals to the radiation absorption coefficient value of said given point and for adding up the output data signals thus obtained to determine the radiation absorption coefficient values for said point.

4,313,164
METHOD OF GENERATING SUBSURFACE CHARACTERISTIC MODELS

Charles Y. Regat, deceased, late of Paris, France (by Rolande Annette Blanche Ibarra, legal representative), assignor to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 178,148, Sep. 7, 1971, abandoned. This application Mar. 12, 1979, Ser. No. 19,926
Int. Cl.[3] G06F 15/20; E21B 47/00
U.S. Cl. 364—422 37 Claims

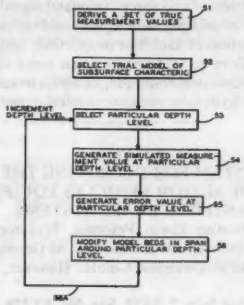
1. A well logging method of producing a representation of the vertical arrangement of subsurface earth formation beds with respect to a subsurface characteristic, which representation is substantially consistent with measurements of the subsurface characteristic taken in a well in the formation with a well logging device, comprising:

(a) producing a set of initial well logging measurements of the subsurface characteristic derived from the measurements taken in the well with the well logging device over a given depth interval;

(b) selecting a trial variation of the subsurface characteristic with depth in the well, said trial variation comprising a trial arrangement of subsurface beds;

(c) computer-generating a new well logging measurement at a particular depth level by applying the approximate response characteristic of the logging device to the trial variation of the subsurface characteristic;

(d) computer-comparing the new well logging measurement at the particular depth level to the initial well logging measurement at that depth level and computer generating an error value as a function of the comparison; and

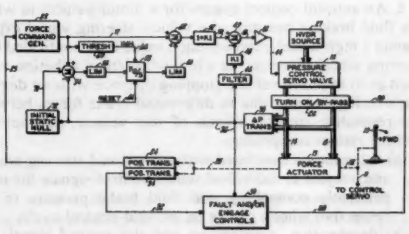

DERIVE A SET OF TRUE MEASUREMENT VALUES
SELECT TRIAL MODEL OF SUBSURFACE CHARACTERIS
INCREMENT DEPTH LEVEL
SELECT PARTICULAR DEPTH LEVEL
GENERATE SIMULATED MEASUREMENT VALUE AT PARTICULAR DEPTH LEVEL
GENERATE ERROR VALUE AT PARTICULAR DEPTH LEVEL
MODIFY MODEL BEDS IN SPAN AROUND PARTICULAR DEPTH LEVEL

(e) computer-modifying the trial variation of the subsurface characteristic in accordance with the error value, the modification being performed over a depth interval which includes the beds of the trial arrangement of beds which are within a preselected span from the particular depth level, to produce a visual or a stored record of said representation of the arrangement of earth formation beds with respect to said subsurface characteristic.

4,313,165
FORCE FEEL ACTUATOR WITH LIMITED PROPORTIONAL/INTEGRAL ERROR FEEDBACK

Douglas H. Clelford, Trumbull, and Donald W. Fowler, West Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 23, 1979, Ser. No. 87,616
Int. Cl.[3] G05B 11/42; B64C 13/04
U.S. Cl. 364—424 6 Claims



1. An aircraft control stick force feel actuator system comprising:

an electrically controlled, hydraulic pressure control servo valve;

a hydraulic actuator connected to the control stick and operable in response to differential fluid pressure applied to opposite ends of the actuator to provide a force to the stick having a magnitude and direction proportional to the fluidic pressure applied to the actuator, said hydraulic pressure being applied to the actuator in response to said servo valve;

means responsive to the pressure applied to each end of said hydraulic actuator to provide a pressure signal indicative of the pressure difference therebetween;

signal processing means for generating a force signal indicative of a raw force command corresponding to a desired

force on the control stick, responsive to said force signal and to said pressure signal for providing a force error signal indicative of the difference between said pressure signal and said force signal, for integrating the force error signal to provide an integral feedback signal, and for providing a force command signal indicative of the summation of the integral feedback signal and the force signal;

means providing a proportional error signal as the sum of a first proportion of said force command signal and a second proportion of said pressure signal, said second proportion being a fraction of said first proportion; and

means responsive to said proportional error signal for providing a force commanding input signal to said electrically controlled, hydraulic pressure control servo valve.

4,313,166
CONTROL SYSTEM FOR IMPROVING THE STEERING STABILITY OF MOTOR VEHICLES EQUIPPED WITH ANTISKID BRAKE SYSTEMS

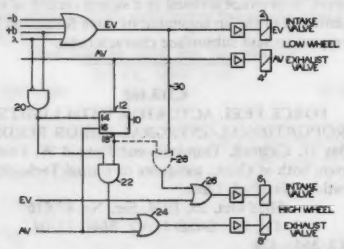
Konrad Rode, Seelze; Erwin Petersen, Wunstorf, and Klaus Lindemann, Hanover, all of Fed. Rep. of Germany, assignors to Wabco Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,128

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851107

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **16 Claims**



1. An antiskid control system for a motor vehicle in which the fluid braking pressure of a vehicle steering wheel experiencing a high wheel/road adhesion value is co-controlled by a steering wheel experiencing a low wheel/road adhesion value such as to improve vehicle stopping distance without degrading steering stability due to differential brake forces between the respective steering wheels of said vehicle, said antiskid control system comprising:

(a) valve means associated with each of said steering wheels and subject to individual wheel control signals for independently controlling said fluid brake pressure of the respective wheels during an antiskid control cycle;

(b) deceleration, acceleration and slip control signals for controlling said valve means associated with one of said wheels so as to effect a reduction of said braking pressure thereat during a brake release phase of an antiskid control cycle, to maintain said brake pressure constant during a holding phase of said antiskid control cycle, and to increase said braking pressure during a reapplication phase of said antiskid control cycle; and

(c) control means operative responsively to operation of said valve means associated with said one wheel during said release and holding phases of said antiskid control cycle for controlling said valve means associated with the other of said wheels so as to maintain said braking pressure thereat constant for at least a first period of time corresponding to said brake release phase of said antiskid control cycle, and so as to effect a reduction of said braking pressure thereat for a second period of time following said first time period.

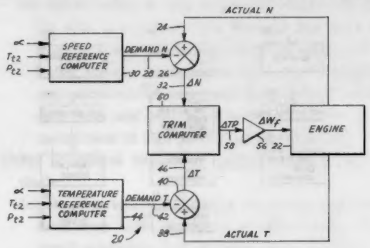
4,313,167
THRUST CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Harold Brown, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 27, 1979, Ser. No. 61,778

Int. Cl.³ F02K *3/00*

U.S. Cl. 364—431.02 **9 Claims**



1. An improved thrust control system for controlling thrust output of a gas turbine engine over its operational life comprising:

first means for determining a first error signal indicative of any deviation of a first thrust-indicating engine operating parameter from a first reference value;

second means for determining a second error signal indicative of any deviation of a second thrust-indicating engine operating parameter from a second reference value;

third means for scheduling at least one trim signal proportional to both any deviation in magnitude between said first and second error signals, and any deviation in magnitude between observed thrust outputs of actual operating engines and the thrust outputs of a nominal engine, and effective for compensating for any deviation in thrust output of said engine from the thrust output of said nominal engine; and

fourth means for combining said first and second error signals and said at least one trim signal and generating a thrust parameter error signal for controlling the thrust output of said engine whereby a substantially fixed relationship between the thrust output and the demanded thrust level over the operational life of the engine is maintained.

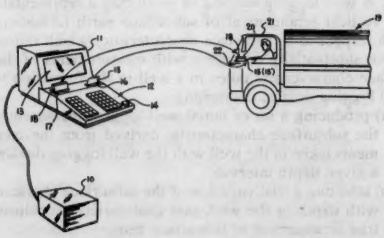
4,313,168
FLUID REGISTER SYSTEM

Walter R. Stephens, Islington, and Patricio Berstein, Thornhill, both of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 10, 1980, Ser. No. 128,647

Int. Cl.³ B67D *5/00*; G06F *15/24*

U.S. Cl. 364—465 **9 Claims**



1. A method of effecting deliveries of fluid commodities to a

number of customers at various, respective delivery sites, comprising the steps of:

(a) entering into a portable storage medium, customer pricing data and infomation relating to fluid commodities to be delivered to a number of select customers, said pricing data and information being unique for each customer, and which can be different for each customer;

(b) placing said portable storage medium into two-way communication with a calculator means to provide for a two-way flow of information and data between said portable storage medium and said calculator means;

(c) entering into said calculator select customer codes;

(d) obtaining a volume amount measurement of at least one fluid commodity being delivered to each given customer at a delivery site;

(e) retrieving from said portable storage medium select pricing data and information corresponding to each respective customer in accordance with said select customer codes;

(f) calculating from said volume amount measurements and said corresponding pricing data and information a bill amount for each delivery to each of said corresponding customers;

(g) printing each calculated bill amount upon a corresponding customer ticket; and

(h) storing each bill amount in said portable storage medium for subsequent retrieval.

4,313,169

FAULT DETECTING SYSTEM FOR LOCATING A FAULT POINT WITH A FAULT RESISTANCE SEPARATELY MEASURED

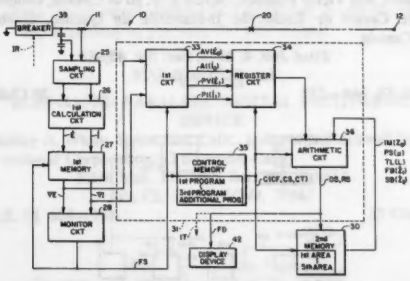
Toshio Takagi, and Yukinari Yamakoshi, both of Tokyo, Japan, assignors to Tokyo Denryoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1979, Ser. No. 63,412

Claims priority, application Japan, Nov. 13, 1978, 53-139583

Int. Cl.[3] G01R *31/08*; G06F *15/56*

U.S. Cl. 364—492 **3 Claims**



1. A fault detecting system for detecting a fault in a transmission line having a pair of ends by calculating a distance between a predetermined one of said ends and a point of occurrence of said fault to produce a distance signal representative of said distance, said transmission line being for transmitting electric power of a voltage and a current and having a characteristic impedance and a propagation constant inherent thereto, each of said voltage and said current having a reference value that is substantially constant unless said fault occurs, wherein the improvement comprises:

sampling means (**25**) to be coupled to said transmission line at said predetermined end for sampling, at a preselected sampling interval, the voltage and the current at said predetermined end into successive voltage and current samples;

calculating means (**26**) responsive to a predetermined number of the successive voltage and current samples for calculating, at each of predetermined calculation instants, a first and a second vector quantity representative of the reference value of the voltage at said predetermined end and that of the current thereat, respectively, to produce a first and a second vector signal representative of the first and the second vector quantities calculated at said each calculation instant, respectively;

first memory means (**27**) for memorizing the first and the second vector signals successively produced by said first calculating means with reference to the respective instants at which the first and the second vector quantities represented by the memorized first and the second vector signals are calculated;

monitoring means (**28**) for monitoring the memorized first and second vector signals to produce a fault occurrence signal upon occurrence of said fault;

second memory means (**30**) comprising a memory area for memorizing a characteristic impedance signal representative of said characteristic impedance and another memory area for memorizing a propagation constant signal representative of said propagation constant;

first means (**33**) responsive to said fault occurrence signal and the memorized first and second vector signals for producing a first and a second anterior signal representative of the respective ones of the first and the second vector quantities calculated at a first of said calculation instants that is earlier than occurrence of said fault and a first and a second posterior signal representative of the respective ones of the first and the second vector quantities calculated at a second of said calculation instants that is not earlier than occurrence of said fault; and

second means (**34–36**) responsive to said first and said second anterior signals, said first and said second posterior signals, said characteristic impedance signal, and said propagation constant signal for calculating an approximate value of said distance in accordance with first predetermined formulae and a second predetermined formula following said first predetermined formulae to produce said distance signal;

said first predetermined formulae being defined by:

$$\alpha = E_r(E_r - E_{Or}) + E_i(E_i - E_{Oi}),$$

$$\beta = I_r(I_r - I_{Or}) + I_i(I_i - I_{Oi}),$$

$$\gamma = E_r(I_i - I_{Oi}) - E_i(I_r - I_{Or}),$$

and

$$\delta = I_r(E_i - E_{Oi}) - I_i(E_r - E_{Or}),$$

where α, β, γ, and δ represent variables and where, when a vector V is represented by $V_r + jV_i$, j being representative of the imaginary unit, E_{Or} and E_{Oi} represent the real and the imaginary parts of the first vector quantity represented by said first anterior signal; I_{Or} and I_{Oi}, the real and the imaginary parts of the second vector qnantity represented by the second anterior signal; E_r and E_i, the real and the imaginary parts of the first vector quantity represented by said first posterior signal; and I_r and I_i, the real and the imaginary parts of the second vector quantity represented by said second posterior signal;

said second formula being:

$$x = (\tan^{-1}[(\delta - \gamma)/(\beta Z_O - \alpha/Z_O)] - \sin^{-1}[(\gamma + \delta)/([\beta Z_O - \alpha/Z_O]^2 + [\delta - \gamma]^2)^{\frac{1}{2}}]) \div (2\mu),$$

where x represents said approximate value; Z_O, said characteristic impedance; and μ, said propagation constant.

4,313,170
AUTOCORRELATION SIDE LOBE REDUCTION DEVICE FOR PHASE-CODED SIGNALS

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1980, Ser. No. 162,346
Int. Cl.[3] G01S *9/233;* G06F *15/31*
U.S. Cl. 364—517 9 Claims

1. A decoder for decoding groups of N^2 sequentially applied signal elements reflected from a reflector element and which have been previously encoded by a polyphase function, where N is an integer, with each group differing from the preceding group by the addition of a new signal element to one end of the group and the deletion of a signal element from the other end of the group, comprising:

oversample-averaging means for adding each of the signal elements of each group to itself at one instant of time to form a first averaged signal having N^2 signal elements and to the corresponding signal elements of a next applied group at another instant of time to form a second averaged signal having N^2 signal elements;

multiplier means for impressing phase rotations on the N^2 signal elements of each averaged signal equal in magnitude but opposite in direction to the phase rotations impressed on the transmitted signal;

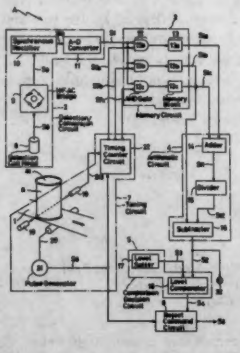
summing means for adding together the phase-rotated signal elements of each averaged signal to form a sub-accumulation signal; and

averaging window means for adding each sub-accumulation signal to a next generated sub-accumulation signal to produce a compressed pulse having a high peak-to-side lobe ratio.

4,313,171
INTERNAL PRESSURE DETERMINING METHOD AND SYSTEM FOR HERMETICALLY SEALED CONTAINERS USING ELECTROMAGNETIC INDUCTION

Kyuichi Shibasaki, Yokosuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 55,047
Claims priority, application Japan, Jul. 8, 1978, 53-083171
Int. Cl.[3] G01L *9/10;* G01M *3/36*
U.S. Cl. 364—558 39 Claims

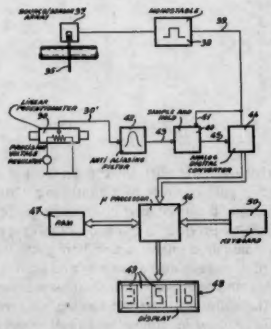


11. An internal pressure inspecting system for hermetically sealed containers, comprising a detection/conversion circuit means connected to convert a signal varying with the change in effective inductance of an inductor as a function of the degree of unevenness of measuring points in the central and peripheral portions located on the diametrical line of the cover of each said hermetically sealed container, conveyor means for conveying said containers at a constant speed past said inductor at a fixed position, said detection/conversion circuit means converting said signal into a DC voltage and being connected to output the latter as a digital signal, a memory circuit means connected to temporarily store the digital signal from said detection/conversion circuit means for each said measuring point and, simultaneously with input of the digital signal at the final measuring point of the cover of each said containers, and for reading and updating the digital signals all at once; an arithmetic circuit means connected to calculate a mean value from the digital signals in said peripheral portion, then to a deviation value thereof from the digital signal at the central measuring point of the cover of each said container; a comparison/decision circuit means for comparing the deviation signal from said arithmetic circuit means with a preset reference level signal and, when the deviation exceeds the upper or lower limit of said reference level signal, for outputting a defective signal; a reject command circuit means responsive to the defective signal from said comparison/decision circuit means for outputting a reject signal after a predetermined delay in the unit of second; and a timing circuit means for sending a clock pulse signal which is synchronized with the movement of the conveyor to said reject command circuit means at the time of passing of each said hermetically sealed container, while at the same time counting said clock pulse signal and sending memory timing signals successively to said memory circuit means.

4,313,172
APPARATUS AND METHOD FOR MEASURING THE ROUGHNESS OF LUMBER

Hans W. Baumans, Outremont; Julian S. W. Tuck, Como; Mohammad Ahmad, Ville Lemoyne; Chon T. Le Dinh, Brossard, and Victor Pinheiro, Sainte-Foy, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Jun. 4, 1979, Ser. No. 45,086
Int. Cl.[3] G01B *5/28*
U.S. Cl. 364—563 20 Claims



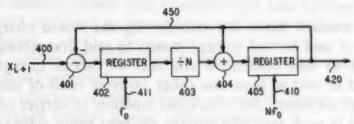
1. A device for measuring irregularities in the thickness of elongated articles, such as wooden boards, said device comprising a housing having aperture means to receive at least a portion of a board to be measured therethrough, a pair of contact probes in said housing each biased against a respective one of opposed surfaces of said boards to sense irregularities in the flatness of said surfaces along a measured length thereof, measurement means connected to said contact probes to provide a measurement signal representative of said sensed ir-

regularites, each probe being secured to a respective one of a pair of spaced support arms biased toward each other, said measurement means being a linear measurement device associated with both said support arms whereby transverse displacement of said contact probes will be transferred to said measurement means to produce an output linear signal representative of the displacement of both said probes, translatory means for measuring the distance of displacement of said board, and to provide reference signals at predetermined intervals of length along said distance of displacement to permit an electronic processing circuit means to obtain a measurement signal of said irregularities at each said reference signal, and output display means to display desired obtained measurements.

4,313,173
LINEAR INTERPOLATOR

James C. Candy, and Bruce A. Wooley, both of Tinton Falls, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 10, 1980, Ser. No. 158,246
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—723 **12 Claims**



1. Apparatus for generating a series of N interpolated samples during each of a series of interpolation intervals defined by successive input samples, comprising:

means for forming the difference between each input sample and an output of said apparatus which represents the preceding input sample,

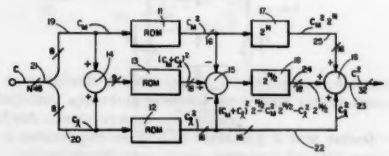
means for dividing said difference by N to form an increment, and

means for repeatedly adding said increment to said output of said apparatus to generate the next output.

4,313,174
ROM-BASED PARALLEL DIGITAL ARITHMETIC DEVICE

Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 17, 1980, Ser. No. 130,653
Int. Cl.³ G06F *7/544, 7/552*
U.S. Cl. 364—753 **23 Claims**



1. A ROM-based fully parallel digital arithmetic device (of N parallel inputs) comprising in combination:

a plurality of at least three square-function ROM's, each having a read address and a read-out,

a read address of a first one of said plurality of ROM's being responsively coupled to a most significant bits part of a N-bit parallel input of said digital device,

a read address of a second one of said plurality of ROM's being responsively coupled to at least significant bits part of said parallel input of said digital device,

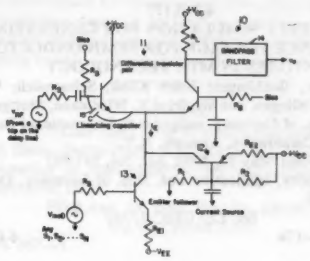
a read address of a third ROM being responsively coupled to a combination of parts of said parallel input;

gain-scaled digital combining means responsively coupled to the read-outs of said square function ROM's to provide an output indicative of the square, C^2, of a value C corresponding to an applied parallel digital input to said device.

4,313,175
LINEARIZED MULTIPLIER DEVICE FOR TRIPLE PRODUCT CONVOLVERS

George L. Kerber, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1980, Ser. No. 137,037
Int. Cl.³ G06G *7/163, 7/19*
U.S. Cl. 364—844 **4 Claims**



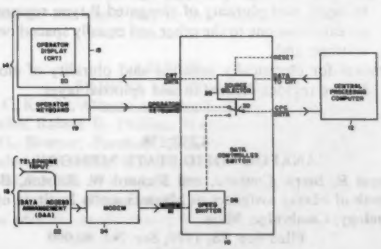
1. In a convolver for optionally calculating Fourier transforms or beamforming and having a delay line tapped by a plurality of variable transconductance multipliers each including a differential transistor pair an improvement therefor is provided comprising:

means coupled across the emitter and base junction of the input transistor of each differential transistor pair for linearizing the impedance of each transconductive multiplier to assure an extended dynamic range of the convolver.

4,313,176
DATA CONTROLLED SWITCH FOR TELEPHONE INPUTS TO A COMPUTER

Lon V. Cecil, Ada, Okla., assignor to The Lockwood Association, Inc., San Antonio, Tex.

Filed Mar. 7, 1980, Ser. No. 128,294
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **10 Claims**



1. A device for switching a central processing computer between a telephone input received through a data access arrangement and modem, and an operator terminal including a visual display and operator keyboard, said device comprising:

means for electrically connecting said device to said central

processing computer, said modem and said operator terminal;

means for setting a keyboard select code and modem select code into said device;

means for comparing incoming data to determine if said keyboard select code or said modem select code have been selected and latching into the selected condition;

speed shifter means receiving telephone data from said modem and upon selecting said modem select code increasing baud rate of each character of said telephone data to a predetermined baud rate of said central processing computer; and

logic means for passing data at said predetermined baud rate to said central processing computer from either said speed shifter or said operator keyboard depending upon which of the aforesaid codes have been selected.

4,313,177

STORAGE CELL SIMULATION FOR GENERATING A REFERENCE VOLTAGE FOR SEMICONDUCTOR STORES IN MTL TECHNOLOGY

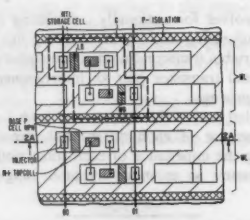
Klaus Heuber, Boeblingen; Erich Klink, Schoenaich; Volker Rudolph, Aidlingen, and Siegfried K. Wiedmann, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1980, Ser. No. 147,997

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 2943565

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—174 **6 Claims**



1. A solid state reference voltage generator circuit structure for a solid state memory fabricated in a P-type substrate of semiconductor material, said solid-state reference voltage generator circuit structure comprising:

an N-type epitaxial layer formed on a surface of said P-type substrate;

an N-type subcollector region formed in said P-type substrate beneath said epitaxial layer;

a plurality of elongated P-type regions formed in said epitaxial layer, said plurality of elongated P-type regions being co-extensive one to the other and equally spaced one from another; and

means for electrically isolating said plurality of elongated P-type regions formed in said epitaxial layer.

4,313,178

ANALOG SOLID STATE MEMORY

Ernest R. Stern, Concord, and Richard W. Ralston, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 28, 1979, Ser. No. 80,099

Int. Cl.³ G11C *11/40*

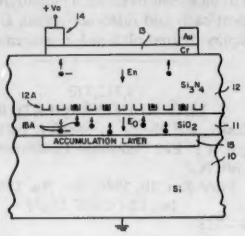
U.S. Cl. 365—183 **14 Claims**

1. An analog signal storage device comprising

a plurality of first storage elements, each comprising a semiconductor substrate having at least two layers, at least one of said layers having a non-linear current vs. field conductivity characteristic and at least one other layer being capable of storing carrier charges therein;

a plurality of second storage means, each associated with one of said plurality of first storage elements;

means for applying an analog signal to said plurality of second storage means so that a charge is stored therein in each of said second storage means, the charge in each of said second storage means being proportional to the amplitude of a portion of said analog signal which is applied thereto;



storage control means for transferring the stored charges in each of said second storage means to said first storage elements so that controlled amounts of carrier charges are stored in said at least one other layer of each of said first storage elements, the controlled amounts of carrier charges stored in each said first storage element being substantially linearly proportional to the charges in said second storage means associated therewith and being stored for a time period longer than the time period of storage in said second storage means.

4,313,179

INTEGRATED SEMICONDUCTOR MEMORY AND METHOD OF OPERATING SAME

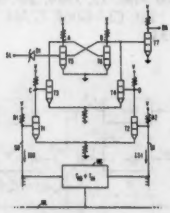
Helmut H. Heimeier, Herrenberg; Wilfried Klein, Holzgerlingen; Knut Najmann, Gaertringen, and Friedrich C. Wernicke, Schoenaich, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,383

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926514

Int. Cl.³ G11C *7/06, 7/00*

U.S. Cl. 365—189 **1 Claim**



1. In a monolithic memory having at least one asymmetric memory cell, said memory cell having a first stable state and a second stable state, said memory cell requiring a greater read time when said cell is in said second state than when said cell is in said first state, reading means for reading said memory cell, said reading means having first and second stable states corresponding respectively to said first and second stable states of said memory cell, said reading means including:

first, second, third, fourth, fifth, sixth and seventh transistors, each said transistor having an emitter, base and collector; a word line coupled to said memory cell; a first bit

line coupling said memory cell to said base of said first transistor; a second bit line coupling said memory cell to said base of said second transistor; a first resistor connecting said base of said first transistor to a first potential; a second resistor connecting said base of said second transistor to said first potential;

said emitter of said first transistor and said emitter of said second transistor connected in common via an eighth resistor to a second potential; said collector of said first transistor and said base of said third transistor connected in common via a third resistor to said first potential; said collector of said second transistor and said base of said four transistor connected in common via a fourth resistor to said first potential;

said emitter of said third transistor and said emitter of said fourth transistor connected in common via a ninth resistor to said second potential; said collector of said third transistor, said collector of said fifth transistor and said base of said sixth transistor connected in common via a fifth resistor to said first potential;

said collector of fourth transistor, said collector of said sixth transistor, said base of said fifth transistor, and said base of said seventh transistor connected in common via a sixth resistor to said first potential;

said emitter of said fifth transistor and said emitter of said sixth transistor connected in common to said second potential;

said emitter of said seventh transistor connected to said second potential;

said collector of said seventh transistor connected via a seventh resistor to said first potential;

set means for setting said reading means in said second state, said set means including a diode connected to said base of said fifth transistor; and

output means for manifesting the stable state of said reading means, said output means including a terminal connected to said collector of said seventh transistor.

4,313,180

REFRESH SYSTEM FOR A DYNAMIC MEMORY

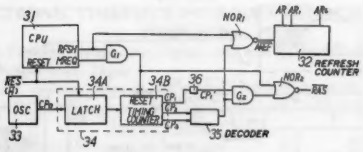
Daisuke Mochizuki, and Shigeru Kitano, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1980, Ser. No. 117,004

Claims priority, application Japan, Jan. 30, 1979, 54-10044

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—222 **7 Claims**



1. A refresh control system for a dynamic memory in an electronic apparatus powered by a main power source, said refresh control system comprising:

a central processor unit including a first refresh control signal developing means powered by said main power source for developing a first refresh control signal;

second refresh control signal developing means separate from said central processor unit and capable of being powered by an auxiliary power source for developing a second refresh control signal, said auxiliary power source providing power to said second refresh control signal developing means when the power to said first refresh control signal developing means has been interrupted, said second refresh control signal developing means including oscillator means, timing counter means responsive to the output of said oscillator means for developing a plurality of timing signals, holding circuit means connected between said oscillator means and said timing counter means for holding the output of said timing counter means at its current value following the restoration of the supply power to the first refresh control signal developing means, and further means responsive to the timing signals from the timing counter means for developing said second refresh control signal;

determination means responsive to the power supplied by the main power source and by the auxiliary power source for detecting whether the power from the main power source being supplied to the first refresh control signal developing means has been interrupted and for developing a first control signal when the power has not been interrupted and developing a second control signal when the power has been interrupted; and

selection control means responsive to the first and second control signals for enabling said first refresh control signal developing means in response to said first control signal and for enabling said second refresh control signal developing means in response to said second control signal.

4,313,181

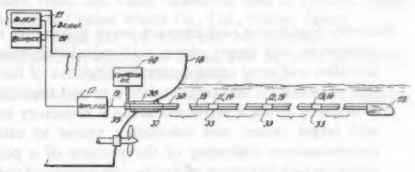
TORPEDO COUNTERMEASURE

Carl H. Holm, Dobbs Ferry, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1962, Ser. No. 220,947

Int. Cl.³ H04K *3/00*

U.S. Cl. 367—1 **10 Claims**



1. Apparatus for protecting a vessel from a waterborne missile launched underwater by air pressure, comprising means for continuously listening to port and to starboard at three spaced locations at predetermined progressive distances astern of the vessel for any waterborne wavefront radiated as a consequence of a waterborne missile launching, and for detecting the passage of such wavefront across each of said spaced locations, means for signalling aboard the vessel the passage of such wavefront across any of said locations, and means for recording on a time base the instants that such wavefront crosses each of said locations and the approximate arrival direction of the wavefront in terms of port or starboard, whereby proper evasive action for the vessel may be determined and taken.

4,313,182

TARGET EQUIPMENT

Lindsay C. Knight, Albury; Anthony T. Curtis, Glenroy, both of Australia; Robert B. Phillips, Walton-on-Thames, and William H. Bowyer, Farnham, both of England, assignors to Australasian Training Aids (Pty.) Ltd., Albury, Australia

Division of Ser. No. 954, Jan. 4, 1979. This application Jul. 16, 1980, Ser. No. 169,393

Claims priority, application United Kingdom, Jan. 6, 1978, 567/78

Int. Cl.³ G01S *5/18*; F41J *5/06*

U.S. Cl. 367—117 **3 Claims**

1. A target apparatus, comprising:

a target;

a plurality of transducers located at spaced positions along a lower edge of and spaced apart from said target, said

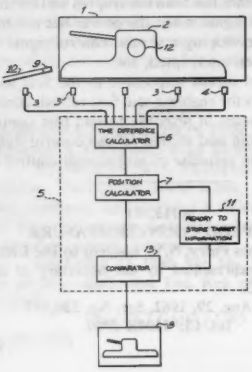
transducers being operative for detecting airborne pressure waves originating in the region of said target;

calculating means responsive to said transducers and operative for:

(1) measuring time differences between respective instants of detection of an airborne pressure wave by said transducers, and

(2) calculating from said time differences and storing a representation of the location of a point at which said airborne pressure wave originated; and

positionable means for generating airborne pressure waves,



whereby positioning said pressure wave generating means relative to said target causes said calculating means to calculate and store representations indicative of the location of points on said target relative to said transducers,

and whereby firing a projectile along a trajectory toward said target causes said calculating means to calculate representations indicative of the position of a point of origin on said trajectory of a projectile-generated airborne pressure wave detected by said transducers relative to said target, wherein said positionable means for generating airborne pressure waves comprises means for creating an electric spark, said electric spark generating a signal transmitted as a pressure wave in air.

4,313,183

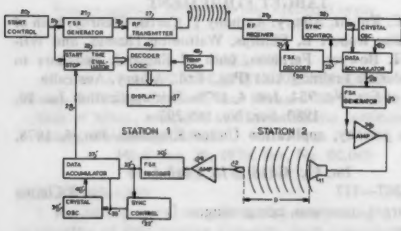
ACOUSTIC DISTANCE MEASURING METHOD AND APPARATUS

James A. Saylors, Smokey Rd., Rte. 1, Athens, Ga. 30601

Filed Jun. 27, 1980, Ser. No. 163,639

Int. Cl.³ G01S *15/74*

U.S. Cl. 367—128 **3 Claims**



1. Distance measuring apparatus comprising:

timing means for detecting the length of time between an occurrence of a first signal and an occurrence of a second signal;

a start control means selectively operable to provide said first signal;

a radio transmitter for providing a radio frequency signal in response to said first signal;

a radio receiver for receiving said radio frequency signal;

a sound generating means for generating a predetermined first subsequence and a second subsequence of sound signals having a predetermined duration in response to said radio receiver receiving said radio frequency signal; and

sound receiving means for receiving and detecting said sound signals comprising a clock and a synchronizing means responsive to said first subsequence to synchronize said clock to said second subsequence and providing said second signal upon detection of termination of said second subsequence.

4,313,184

SONAR SYSTEMS

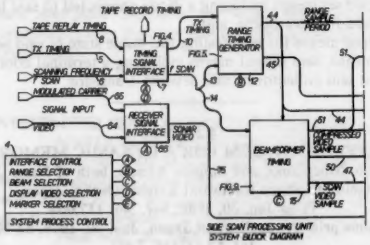
Leonard B. Jarman, Yeovil, and Keith M. Allan, Henstridge, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

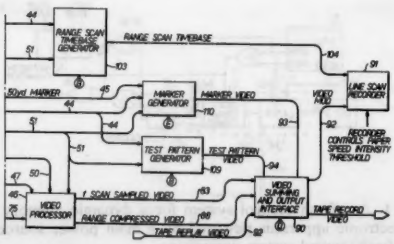
Filed Feb. 5, 1980, Ser. No. 118,665

Claims priority, application United Kingdom, Feb. 7, 1979, 04296/79

Int. Cl.³ G01S *15/89*

U.S. Cl. 367—88 **8 Claims**





1. A side scan sonar system comprising a sonar transmitter transducer means for transmitting sonar signal pulses so as to produce an arc on insonification extending to one side of a line along the direction of forward motion of a ship, a line array of receiver transducers for receiving echo signals within the arc, an electronic scanning beamformer adapted to combine the signals of the transducers of the line array so as to form a directional receiving beam and to steer the said beam electronically through a scanning angle within the arc of insonification, sampling means arranged to receive the combined signals of the transducers, sampling control means synchronised with the transmitted pulses and operative to control the sampling means to select signals appertaining to a predetermined sector or strip

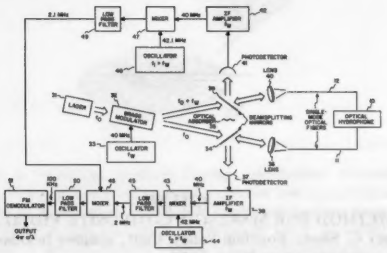
within the scanning angle which signals provide information signals for visual display means.

4,313,185

ACOUSTIC VIBRATION SENSOR AND SENSING SYSTEM

Joseph L. Chovan, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,861
Int. Cl.[3] H04R *1/44*; G01B *9/02*
U.S. Cl. 367—149 **10 Claims**



1. An acoustic vibration sensor comprising:

A. a first single mode optical fiber extending to the sensing region,

B. a second single mode optical fiber extending to said sensing region,

C. means at said sensing region coupling optical energy from said first fiber to said second fiber including a first partially reflecting discontinuity which reflects optical energy in said first fiber backward from the sensing region,

D. means at said sensing region coupling optical energy from said second fiber to said first fiber including a second partially reflecting discontinuity which reflects optical energy in said second fiber backward from the sensing region, and

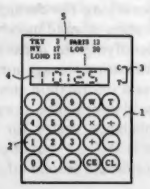
E. means for modulating the length of said optical coupling paths between fibers in response to the acoustic vibrations in said sensing means.

4,313,186

ELECTRONIC TIMEPIECE WITH TIME ZONE CHANGE FEATURES

Kunio Yoshida, Tsugemura, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1978, Ser. No. 889,906
Claims priority, application Japan, Mar. 25, 1977, 52/33805
Int. Cl.[3] G04B *19/22*
U.S. Cl. 368—22 **5 Claims**



1. A timepiece with time zone change functions comprising:

timekeeping means for developing and storing horological information therein;

first storage means for storing a time difference of a first geographical region with respect to a specific reference region, the present time of the first geographical region being stored and updated within said timekeeping means;

means for introducing into said timepiece a time difference of a second geographical region with respect to said specific reference region, the present time of the second region being sought to be calculated by the time zone change functions;

second storage means responsive to said means for introducing for storing the time difference of the second region with respect to said specific reference region therein;

means for determining a relative time difference between said first and second geographical regions by using the contents of said first storage means and said second storage means; and

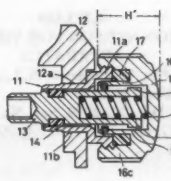
means for effecting the time zone change functions of said timepiece by developing new horological information through the use of the horological information stored within said timekeeping means and the relative time difference, thereby determining the present time in the second region.

4,313,187

WATER RESISTING CROWN STRUCTURE FOR ELECTRONIC WRISTWATCHES

Masahiko Waki, and Yasuo Maekawa, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1980, Ser. No. 143,546
Claims priority, application Japan, Jan. 24, 1980, 55-7383[U]
Int. Cl.[3] G04B *29/00, 27/02*
U.S. Cl. 368—319 **3 Claims**



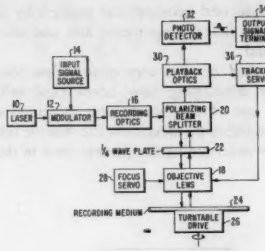
1. A crown structure for an electronic wristwatch, comprising:

a guide pipe secured to the case of said wristwatch, said guide pipe having an outwardly projected large diameter portion and a thread formed on said large diameter portion, a crown stem slidable engaged in said guide pipe, said crown stem having a hole axially extending from the outer end thereof and a non circular flange in an outer end portion, a cylindrical crown having an inner cylindrical portion adapted to be inserted in said large diameter portion and an outer cylindrical portion having an inner thread engageable with said thread of said guide pipe, said inner cylindrical portion and outer cylindrical portion being coaxial with said crown stem and large diameter portion of said guide pipe, said inner cylindrical portion having an axial hole portion having a non-circular cross-section engaged with said non-circular flange, a packing provided in a space between said inner cylindrical portion and outer cylindrical portion, a spring provided in said hole of said crown step, and a projected means formed on the inner wall of said axial hole portion so as to engage with the inside end of said non-circular flange.

4,313,188
METHOD OF RECORDING AN ABLATIVE OPTICAL RECORDING MEDIUM

Robert A. Bartolini, Trenton; William J. Burke, Princeton Junction, and Allen Bloom, East Windsor, all of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 668,504, Mar. 19, 1976, abandoned.
This application Oct. 22, 1979, Ser. No. 87,449
Int. Cl.[3] G11B 7/00; G01D 15/34; H04N 5/76
U.S. Cl. 369—109 6 Claims

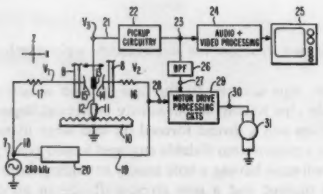


1. A method of preparing an information record employing a laser of a given frequency which comprises the steps of:
evaporating a layer of aluminum from about 250 to about 500 angstroms thick onto a substrate under vacuum which is reflective at the laser output frequency,
oxidizing said aluminum layer to a depth of from about 25 to 30 angstroms,
coating said oxidized aluminum layer with an ablative light absorbing layer which is absorptive at the laser output frequency, and
recording an information track comprising a light reflective-light absorptive pattern.

4,313,189
STYLUS POSITION SENSOR FOR VIDEO DISC PLAYER APPARATUS

William G. McGuffin, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,504
Int. Cl.[3] G11B 17/30, 7/00, 9/00; H04N 5/76
U.S. Cl. 369—220 4 Claims

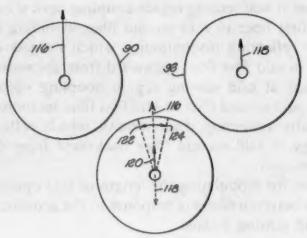


1. A video disc stylus carriage relative position sensing apparatus for generating a signal related to the stylus position within a supportive carriage comprising:
first and second electrodes fixedly secured to a stylus carrying carriage;
a third electrode having a fixed relation to said stylus and disposed between said first and second electrodes, said first and third and said second and third electrodes forming respectively first and second capacitors which vary in capacitance in accordance with the relative position of the stylus with respect to the carriage and wherein said stylus is mounted to permit relative movement between said stylus and the carriage;
means for applying first and second phase related time varying signals to the first and second electrodes respectively, said first and second time varying signals being respectively coupled to the third electrode through the capacitance of the first and second capacitors respectively thereby providing a third signal at said third electrode, the phase and amplitude of said third signal being related to the relative position of the third electrode and thereby the stylus with respect to the first and second electrodes; and
detection means responsive to said third signal for generating a substantially d.c. signal proportional to the position of the stylus relative to the carriage.

4,313,190
METHOD FOR MAKING A COMPOSITE VIDEO DISC

Gary G. Slaten, Fountain Valley, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 3,148, Jan. 15, 1979. This application Dec. 26, 1979, Ser. No. 97,578
Int. Cl.[3] H04N 5/76; G11B 7/00
U.S. Cl. 369—275 1 Claim

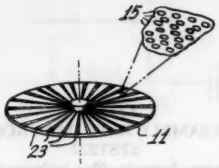


1. The method of assembling a composite video disc structure, comprising the steps of:
forming a first information storage member of uniform and constant thickness of a plastic type material of variable density, said member having at least an information bearing surface;
forming a light reflective and moisture impervious layer over said information bearing surface;
repeating said first two steps for forming a second information storage member;
measuring and identifying the density imbalance vector of said first information storage member;
measuring and identifying the density imbalance vector of said second information storage member;
orienting one of said information storage members relative to the other of said information storage members such that said density imbalance vector for said first information storage member is 180°±3° out of phase with said density imbalance vector of said second information storage member;
joining said oriented first information storage member to said second information storage member to form a composite video disc structure; and
measuring and identifying said density imbalance vector of said composite video disc structure at full rotational speed.

4,313,191
RECORDING MEDIUM HAVING A PILOT SIGNAL WITH AN ALIGNED PHASE ANGLE IN ADJACENT TRACKS

John S. Winslow, Altadena, and Wayne R. Dakin, Redondo Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 920,701, Jun. 30, 1978, Pat. No. 4,236,050.
This application Mar. 31, 1980, Ser. No. 136,130
Int. Cl.[3] G11B 7/24, 19/24, 23/36
U.S. Cl. 369—275 4 Claims

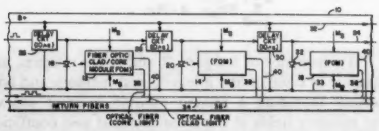


1. In a recording medium having information recorded thereon in a plurality of substantially circular and concentrically-arranged information tracks, said recording medium being a light-reflective disc and each information track including a sequence of spaced regions of non-reflectivity representative of the recorded information, said recording medium being suitable for use with playback apparatus that recovers the recorded information by focusing a beam of light onto a selected track as the medium is moved in a prescribed fashion, to produce a reflected beam having an intensity modulated by the recorded pattern of regions of non-reflectivity, for detection by an information recovery device, an improvement wherein the recorded information comprises a modulated carrier signal and a pilot signal, said pilot signal having a prescribed, constant frequency substantially lower than a substantial portion of the frequency components of the modulated carrier signal, wherein the recorded pilot signal includes a prescribed, integral number of cycles on each track and the phase angle of the pilot signal is aligned with itself on adjacent tracks, and wherein the duty cycle of the recorded pattern of regions of non-reflectivity varies in accordance with the phase of the pilot signal, whereby the playback apparatus can function to controllably adjust the speed of the recording medium relative to the focused beam of light such that the phase angle of the recovered pilot signal component is substantially synchronized with the phase angle of a locally-generated reference signal, even when the beam of light is improperly focused on the recording medium such that the reflected beam is modulated by information recorded on more than a single information track, simultaneously, and even when the beam of light is traversing the recording medium from one track to another.

4,313,192
OPTICAL TRANSDUCER ARRAY SYSTEM

David E. Nelson, and John V. Bouyoucos, both of Rochester, N.Y., assignors to Hydroacoustics, Inc., Rochester, N.Y.

Filed Sep. 11, 1979, Ser. No. 74,268
Int. Cl.[3] H04J 3/02
U.S. Cl. 370—4 15 Claims

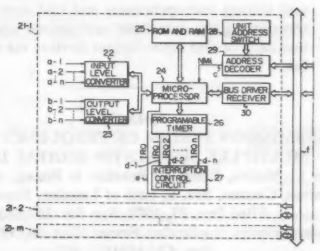


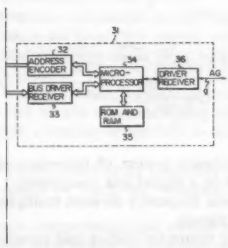
1. A transducer system which comprises an array of optical transducers each having an optical waveguide with at least two output ports for propagating light applied to said waveguide, means responsive to the parameter to be transduced for deforming said guide to modulate the amplitude of said light propagated through the waveguide to produce output optical signals at the output ports which respectively increase and decrease in amplitude with increasing deformation, separate electro-optical light sources for applying light to each of said waveguides, a pair of optical waveguides providing an optical signal highway, said pair of highway waveguides being coupled to the output ports of each of said transducer waveguides, and means for successively enabling each of said sources to apply successive pulses of light to each of said transducer waveguides whereby optical signals from each of said transducers appear in time division multiplexed relationship on said highway waveguides.

4,313,193
TIME DIVISION MULTIPLEX TRANSMISSION APPARATUS

Tokutaka Nakano, Kawasaki; Takao Sakata, Yokohama; Masamichi Iwama, Isehara, and Takao Isago, Ichikawa, all of Japan, assignors to Fujitsu Limited and Kokusai Denshin Denwa Co., Ltd., both of, Japan

Filed Dec. 10, 1979, Ser. No. 101,692
Claims priority, application Japan, Dec. 28, 1978, 53-164984
Int. Cl.[3] H04J 3/02
U.S. Cl. 370—43 7 Claims





1. A time division multiplex transmission apparatus for transmitting subscriber's line level signals such as low-speed data and telegraph signals of a maximum of n×m channels, where n and m are integers, as high-speed data in a time division multiplexed system, and for separating received high-speed data into low-speed data and telegraph signals, said time division multiplex transmission apparatus comprising:

a common bus for providing address signals;

m input/output devices, each of said m input/output devices comprising:

a level converter circuit for converting the subscriber's line level signals of n channels into an internal logic level;

a first microprocessor, operatively connected to said level converter circuit, for regenerating the start-stop of n channels of signals and for regenerating telex signals;

a programmable timer circuit, operatively connected to said first microprocessor, for controlling the interruption time of n channels of signals into said first microprocessor;

an interruption control circuit, operatively connected between said programmable timer circuit and said first microprocessor, for determining the priority order of interruption of n channels of signals into said first microprocessor;

a setting switch for setting a self-address to transfer data to a time slot to which the high-speed data have been alloted;

an address decoder, operatively connected to said setting switch and the common bus, for decoding address signals from said setting switch and the common bus; and

a first bus driver receiver, operatively connected to said first microprocessor and said common bus, for transferring the data from said first microprocessor via said common bus; and

a high-speed data processing device comprising:

a second microprocessor for multiplexing and separating signals of a maximum of m×n channels, for generating and detecting frame patterns and for keeping a synchronization frame, and for generating address signals of m×n channels;

an address encoder, operatively connected to said second microprocessor and the common bus, for encoding the address signals of said second microprocessor; and

a second bus driver receiver, operatively connected to said second microprocessor and said common bus, for transferring the data from said second microprocessor into each of said input/output devices via said common bus.

4,313,194

TRANSMISSION SYSTEM OF FREQUENCY DIVISION MULTIPLEX SIGNALS ON DIGITAL LINKS

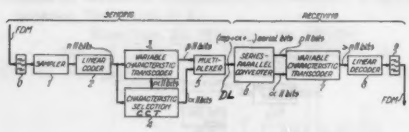
Xavier C. Maitre, Route de Pennker le Boung, and Alain M. Thomas, Cosmos, Bat. E, both of Lannion, France (22300)

Filed Dec. 27, 1979, Ser. No. 107,563

Claims priority, application France, Dec. 28, 1978, 78 36758

Int. Cl.³ H04H 1/02

U.S. Cl. 370—69 **2 Claims**



1. A transmission system of frequency division multiplex analog signals on a digital link comprising:

a sampler of said frequency division multiplex signals generating sample signals;

a linear coding means for coding said sample signals into n-bit sample words;

means for selecting a plurality of integers k each representing a number of successive levels of a n-bit code to be transcoded into one and the same level of a p-bit code with p smaller than n, said integers being one of the natural numbers between unity and 2^{n-p};

means for forming and selecting transcoding control words of α bits expressing in binary code the integers k selected;

a first transcoding means for transcoding each n-bit sample word into a p-bit on-line word depending upon the selected transcoding control word, said first transcoding means being formed by a read only memory having said p-bit on-line words stored therein at addresses formed by α set of n-bit sample words, each p-bit word being selectively transcoded from one among α n-bit sample words responsively to the transcoding control word selected;

multiplexer means receiving the bits of the on-line words and the additional bits of the control words from said first transcoding means and serially sending said on-line and additional bits on said digital link;

a second transcoding means for transcoding the p-bit on line words into reconstituted n-bit sample words, said second transcoder means being controlled by said additional bits of said control words; and

a linear decoding means for decoding said reconstituted n-bit sample words.

4,313,195

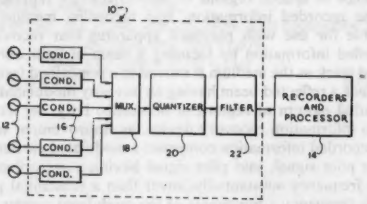
REDUCED SAMPLE RATE DATA ACQUISITION SYSTEM

Joseph L. Lehmann, Sarasota, Fla., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 23, 1979, Ser. No. 32,621

Int. Cl.³ H04J 3/04

U.S. Cl. 370—84 **19 Claims**



1. An improved data acquisition system of the type having a plurality of input circuits for receiving data, an output circuit supplying acquired data to other equipment for processing, recording or other data handling, and means coupled to said input circuits for sampling said data prior to delivering the data samples to said output circuit at a sample rate, wherein the improvement comprises a filter coupling said sampling means to said output circuit, said filter reducing the sample rate of the system and including:

an input circuit applying each data input sample $Z(t_i)$ to a multiplier;

a coefficient memory device coupled to said multiplier and storing a plurality of impulse response coefficients H;

a first modulo counter coupled to said coefficient memory device for sequencing through selected ones of said coefficients corresponding to a particular $Z(t_i)$ and sequentially indexing and applying said coefficients to said multiplier for multiplication with said input sample;

a memory and adder arrangement coupled to said multiplier for storing signals representing the set of summations

$$\sum_{i=0}^{k-1} Z(t_{pR+i}) \cdot H_{K-i}$$

where P is a sequence of integers, R and K are integers, and i is a sequence of consecutive integers, said memory and adder arrangement including a second modulo counter indexing different memory fields at the same rate that said coefficients are indexed for each data sample; and

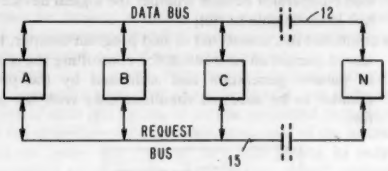
a filter output coupled to said memory and adder arrangement and outputting a filtered sample for each group of a predetermined number of input samples $Z(t_i)$.

4,313,196

PRIORITY SYSTEM WITH LOW SPEED REQUEST BUS

Jan G. Oblonsky, Brookeville, Md., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,069
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—85 **4 Claims**



4. A polling system for n data processing units operable in time slots of a pre-determined minimum duration, comprising, a request bus having j signal carrying conductors where j is greater than **1** and further comprising for each unit,

an i bit counter and means for running the counter in synchronism with counters of other units at a rate to count through a pre-determined sequence of count values during each time slot, where i+j is the number of bits required to assign each of the n units a unique priority code, each count of said counter defining a sub-slot,

means providing a pre-assigned priority code of i+j bits,

means comparing the i bits of the priority code with the i bits of the counter and signifying a match or mis-match,

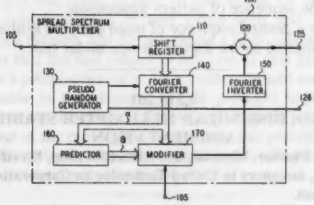
means responsive to a match in one sub-slot to terminate the generation of further sub-slots and means for signaling between units on said request bus the relative priorities of a plurality of units making a request in the same sub-slot whereby the unit of highest priority takes access to the next time slot.

4,313,197

SPREAD SPECTRUM ARRANGEMENT FOR (DE)MULTIPLEXING SPEECH SIGNALS AND NONSPEECH SIGNALS

Nicholas F. Maxemchuk, Mountainside, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1980, Ser. No. 138,721
Int. Cl.³ H04J *3/02*
U.S. Cl. 370—111 **8 Claims**



1. A signal processor including a first input terminal **(105)** adapted to receive a speech signal, a second input terminal **(185)** adapted to receive a nonspeech signal, means for multiplexing said speech signal and said nonspeech signal, means for extending said multiplexed signal to an output terminal **(125)**, said output terminal adapted for transmitting said multiplexed signal to a receiver and characterized in that

said multiplexing means includes spread spectrum means **(100)** for multiplexing said speech signal and said nonspeech signal, said spread spectrum multiplexing means including

means **(110)** for delaying said speech signal,

means **(140)** for converting said speech signal from a first domain to a second domain, said second domain signal having a plurality of components,

means **(130)** for selecting one of said components,

means **(160)** responsive to said selected component for providing a prediction of said selected component,

means **(170)** responsive to said nonspeech signal for modifying said prediction,

means **(150)** for converting said modified prediction from said second domain to said first domain, and

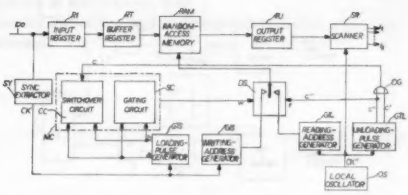
means **(120)** for extending said delayed speech signal and said modified first domain signal to said output terminal.

4,313,198

SYNCHRONOUS DEMULTIPLEXER WITH ELASTIC BIT STORE FOR TDM/PCM TELECOMMUNICATION SYSTEM

Gabriele Mazzocchi, Piacenza, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 17, 1979, Ser. No. 85,795
Claims priority, application Italy, Oct. 18, 1978, 28848 A/78
Int. Cl.³ H04J *3/02, 3/06*
U.S. Cl. 370—112 **6 Claims**



1. A demultiplexer for an incoming bit stream organized in a succession of frames of m time slots each encompassing a group of n bits arriving over a signal path, comprising:

input register means connected to said signal path for temporarily receiving successive n-bit groups;

synchronization means connected to said signal path for extracting a train of first clock pulses with cycles T', corresponding to said time slots, from said incoming bit stream;

a local source of second clock pulses with cycles $T'' \approx T'$;

storage means with m cells accommodating respective n-bit groups and with a loading connection to said input register means;

output register means linked by an unloading connection to said storage means for receiving successive n-bit groups therefrom;

distributing means connected to said output register means for routing said n-bit groups to different outgoing channels;

first address-generating means stepped by said first clock pulses every cycle T' for identifying a cell of said storage means in which an n-bit group present in said input register means is to be written via said loading connection;

second address-generating means stepped by said second clock pulses every cycle T'' for identifying a cell of said storage means from which an n-bit group is to be read out to said output register means via said unloading connection;

first timing means driven by said first clock pulses for generating a series of writing commands with a recurrence period equal to a cycle T' and of a length corresponding to a minor fraction of their recurrence period;

second timing means driven by said second clock pulses for generating a series of reading commands with a recurrence period equal to a cycle T'' and of a length corre-

sponding to a minor fraction of their recurrence period, one of said series of commands consisting of two interleaved sets of pulses;

gating means connected to said first timing means for selectively passing pulses of either of said interleaved sets;

switchover means connected to said first and second timing means for controlling said gating means to give passage to writing commands not coinciding with reading commands; and

commutating means responsive to the pulses passed by said gating means and to the other of said series of commands for alternately connecting said first and second address-generating means to an address input of said storage means.

4,313,199

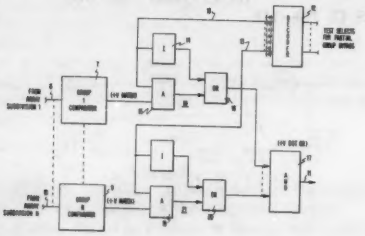
RECIRCULATING LOOP MEMORY ARRAY FAULT LOCATOR

Frederick J. Aichelmann, Jr., and Bruce E. Bachman, both of Hopewell Junction, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,374

Int. Cl.³ G06F *11/16*

U.S. Cl. 371—21 **7 Claims**



1. Logic means on an array chip for testing the constituent recirculating loop memory elements of said array, said means comprising

means for addressing all of said elements and for loading said elements with the same test bits

a plurality of comparison gate means,

each said comparison gate means being connected to the outputs of a respective subdivision of said array of elements for ANDing said outputs to produce a respective first output signal when all said outputs are identical on a serial bit-by-bit basis and to produce a respective second output signal when all said outputs are not identical, and

means for sensing in serial succession the respective output signals from said plurality of comparison gate means.

4,313,200

LOGIC TEST SYSTEM PERMITTING TEST PATTERN CHANGES WITHOUT DUMMY CYCLES

Junji Nishiura, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Aug. 24, 1979, Ser. No. 69,345

Claims priority, application Japan, Aug. 28, 1978, 53-105300; Sep. 4, 1978, 53-108257; Sep. 6, 1978, 53-123089[U]; Sep. 6, 1980, 55-110132; Apr. 11, 1979, 54-43774; Apr. 20, 1979, 54-49312

Int. Cl.³ G06F *11/22*

U.S. Cl. 371—25 **15 Claims**

1. A logical device test system, for connection to a desired logical device under test, which comprises:

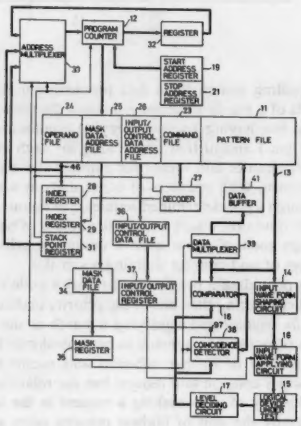
a pattern file having stored therein a test pattern composed of at least an input pattern and an expected value pattern;

a program counter, connected to said pattern file, which addresses said pattern file;

means, connected to said pattern file and to the logical device under test, for applying said input pattern of the one of said test patterns which is addressed by said program counter to a logical device under test;

a comparator, connected to said pattern file and to the logical device under test, which compares the output from the logical device under test with the expected value pattern of the one of said test patterns which is addressed by said program counter, wherein the comparison performed by said comparator detects whether the logical device under test is acceptable or not;

a command file, connected to said program counter, having stored therein an instruction for controlling the sequence of pattern generation and addressed by the program counter to be accessed simultaneously with the pattern file;



an operand file, connected to said command file and to said program counter, having stored therein data to be used by the instruction in the command file at the corresponding address, said operand file being addressed by said program counter to be accessed simultaneously with the pattern file;

a decoder, connected to said command file, for decoding the instruction read from the command file; and

pattern generation sequence control means, connected to said decoder, to said operand file, and to said program counter, for controlling the program counter in accordance with the decoded result from said decode r to control the sequence of pattern generation;

whereby a desired sequence of input patterns is uninterruptedly applied to the logical device under test.

4,313,201

TESTED, DISSIMILAR HELICOPTER STABILITY AUGMENTATION

William C. Fischer, Monroe, and Albert Sivahop, Stratford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 5, 1980, Ser. No. 127,332

Int. Cl.³ G06F *11/16, 11/22*

U.S. Cl. 371—68 **2 Claims**

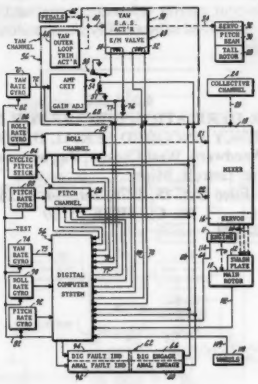
1. A dissimilar, redundant stability augmentation system operable in a plurality of controlled attitude axes of an aircraft, comprising:

a plurality of stability augmentation actuators each having a pair of electrical control inputs, each operable to provide a mechanical input to the corresponding one of said axes in response to the additive effects of signals applied to said pair of electrical control inputs thereof;

a plurality of analog amplifiers, one for each of said axes, each of said amplifiers being selectively connectable to one of the electrical inputs of the stability augmentation actuator of the corresponding axis;

a digital computer system having analog inputs and having an analog output for each of said axes, each of said outputs being selectively connectable to the other of said electrical inputs of the stability augmentation actuator of the corresponding axis, said computer system comprising means for reading in analog input signals and for providing corresponding stability augmentation command signals to related ones of said analog outputs;

a plurality of rate gyros, there being a pair of rate gyros corresponding to each of said attitude axes, one of the rate gyros of each pair having its output connected to the input of the amplifier of the corresponding axis of the aircraft, and the other rate gyro of each pair having its output connected to an analog input of said digital computer system;



characterized by each of said rate gyros being responsive to a test signal input to provide a predetermined output signal when it is functioning properly, said digital computer system being connected to the test signal input of each of said gyros, said one rate gyro of each pair also being connected to an analog input of said digital computer system, said aircraft having means for providing preflight indication that the aircraft is stationary on the ground, said digital computer system comprising means operable in response to said preflight indication for providing a test signal to each of said gyros, for reading the test output of each of said gyros with said test signal applied thereto, and for providing a fault indication in the event that the test output of any one of said gyros differs from a permissible value by a predetermined amount, and operable in the absence of said preflight indication for comparing the output of one gyro in each pair with the output of the other gyro in such pair and providing a fault manifestation in response to the outputs of a pair differing by a predetermined amount.

4,313,202

MODEM CIRCUITRY

Andrew M. Kameya, Medfield, Mass., assignor to Codex Corporation, Mansfield, Mass.

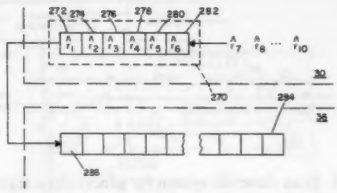
Filed Apr. 3, 1980, Ser. No. 136,919

Int. Cl.³ H04B *3/04*

U.S. Cl. 375—15 **4 Claims**

1. Modem receiver apparatus having means for receiving, demodulating, and decoding a modulated, double side band carrier signal encoded to represent digital bits wherein the received signal is converted to a stream of real-valued digital samples, wherein said apparatus comprises,

digital phase splitting filter circuitry for storing a changing sequence of successive said samples, multiplying a single, real-valued, stream of said stored samples respectively by coefficients, and combining the products of said multiplication to provide a complex-valued output consisting of a pair of output streams having associated carrier frequencies which, due solely to the selection of said coefficients, are equal but 90° apart in phase, said coefficients being selected to establish a relationship between said outputs and said stored samples corresponding to bandpass filtering having an amplitude response that does not exhibit even symmetry in the frequency spectrum about the frequency of said carrier, and



means for thereafter demodulating and encoding said output streams.

4,313,203

TRANSMISSION SYSTEM FOR THE TRANSMISSION OF BINARY DATA SYMBOLS

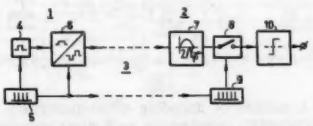
Petrus J. van Gerwen, and Wilfred A. M. Snijders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,038

Claims priority, application Netherlands, Apr. 20, 1979, 7903103

Int. Cl.³ H03K *3/02*

U.S. Cl. 375—17 **3 Claims**

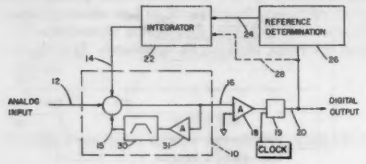


1. A transmission system comprising a transmitter and a receiver for the transmitter of binary data symbols in synchronous consecutive symbol time intervals having a duration of T seconds, characterized in that the transmitter comprises means for converting each data symbol into two rectangular pulses of opposite polarity, corresponding points of which are separated by a duration of T/2 seconds, each pulse having a duration of T/4 seconds, and occurring at, or after, a respective period from the beginning of the symbol time interval, and, that the receiver comprises means for filtering the received signal, comprising the converted data symbols, in accordance with a low-pass filter characteristic having zeros at 0 Hz and 2/T Hz and a sinusoidal response curve between said zero frequencies.

4,313,204
DIGITAL ENCODING CIRCUITRY WITH MEANS TO REDUCE QUANTIZATION NOISE

Richard E. DeFreitas, Westford, Mass., assignor to DeltaLab Research, Inc., Chelmsford, Mass.

Filed Oct. 29, 1979, Ser. No. 89,210
Int. Cl.[3] H03K 13/22
U.S. Cl. 375—28 20 Claims

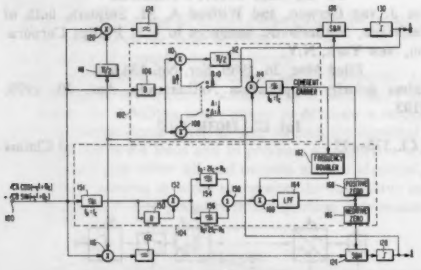


1. In an electrical system for generating a digitally-encoded signal from an analog input signal, including comparator means for comparing said analog signal to a decoded signal determined by decoding said digitally-encoded signal, said comparator means including means for forming the difference between said analog and decoded signals, the improvement comprising means for reducing the audible component of the quantization noise in said decoded signal by modifying the audible frequency component of the analog input signal to said comparator means.

4,313,205
CARRIER SYNCHRONIZATION AND SYMBOL SYNCHRONIZATION FOR OFFSET-QPSK BURST COMMUNICATIONS

Smith A. Rhodes, Chantilly, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jul. 7, 1980, Ser. No. 166,288
Int. Cl.[3] H04L 27/22; H03D 3/02
U.S. Cl. 375—86 10 Claims



1. In a method of decoding offset-quaternary phase shift keying (O-QPSK) signal bursts, each burst including a preamble portion and a remaining message portion, said O-QPSK signal including first and second carriers in phase quadrature with one another and modulated with first and second bit sequences, respectively, to achieve first and second modulation waveforms, said method of decoding including combining said O-QPSK signal with a coherent carrier reference signal and a phase-delayed coherent carrier reference signal to thereby obtain said first and second modulation waveforms and sampling said first and second modulation waveforms with first and second symbol timing signals to obtain estimates said first and second bit sequences, said first bit sequence during said preamble having a constant value whereby said first carrier is unmodulated during said preamble, and said second bit sequence alternating between +1 and −1 values during said preamble, a method of generating said coherent carrier and said symbol timing signals comprising the steps of:

filtering said O-QPSK signal during said preamble to obtain said coherent carrier reference signal;

delaying said O-QPSK signal by substantially $T_s/2$ to obtain a delayed O-QPSK signal, where T_s is the quaternary symbol interval;

multiplying said O-QPSK and delayed O-QPSK signals to obtain a delay-and-multiply output signal having upper and lower sidebands;

filtering said delay-and-multiply output signal to obtain said upper sideband thereof;

frequency doubling said coherent carrier reference signal to obtain a doubled carrier;

mixing said doubled carrier with said upper sideband to obtain a synchronization product having a lower sideband;

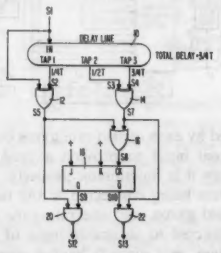
filtering said synchronization product to obtain the lower sideband thereof; and

deriving said first and second symbol timing signals from the lower sideband of said synchronization product, whereby said coherent carrier reference signal and symbol timing signal are derived substantially simultaneously during said preamble.

4,313,206
CLOCK DERIVATION CIRCUIT FOR DOUBLE FREQUENCY ENCODED SERIAL DIGITAL DATA

Thomas R. Woodward, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 19, 1979, Ser. No. 86,268
Int. Cl.[3] H03K 13/20
U.S. Cl. 375—110 36 Claims



1. A circuit arrangement for reconstructing the timing information encoded in an incoming double frequency transition-event waveform, said incoming waveform characterized as including both guaranteed and non-guaranteed transitions, said incoming waveform further characterized as having a bit cell duration of T, said circuit arrangement comprising:

delay line means, responsive to said incoming waveform, said delay line means for generating delayed versions of said incoming waveform;

detecting means, responsive to said incoming waveform and said generated delayed versions of said incoming waveform, said detecting means for detecting each transition in said incoming waveform and producing first and second transition waveforms, each of said transition waveforms identifying each transition in said incoming waveform, the second transition waveform corresponding to the first transition waveform delayed by a fixed time interval;

composite clock forming means, connected to said detecting means, said composite clock forming means for forming a composite clock from said two transition waveforms;

toggling means, receiving an input from the output of said composite clock forming means, said toggling means including means for generating a first output which toggles between a high and a low state in response to each

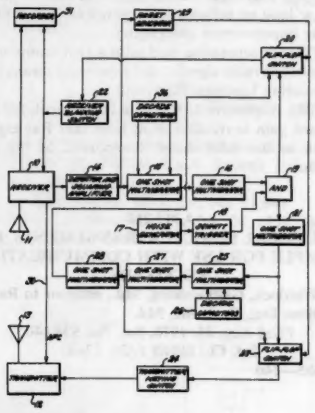
one of a set of unidirectional going transitions in said composite clock; and

first timing means, connected to the first output of said toggling means and said detecting means, said first timing means for generating a first timing signal coincident with the start of each of said guaranteed transitions in said incoming waveform.

4,313,207
METHOD AND SYSTEM FOR SELECTIVELY DISRUPTING RADIO TELEGRAPH COMMUNICATIONS

Vincent J. Nardozza, Rome, and Marvin R. Clinch, Oneida, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 10, 1967, Ser. No. 616,423
Int. Cl.³ G01S 7/36
U.S. Cl. 455—1 **5 Claims**



1. The method of selectively disrupting discrete keyed continuous wave radio communication wherein the discrete keyed continuous wave signal conveys intelligence by virtue of the duration and spacing of a coded series of characters comprising the step of receiving said discrete keyed continuous wave signals, the step of selectively inserting additional characters within the spaces between the characters of the original discrete keyed continuous wave signal, the step of selectively varying the width of said inserted characters, the step of inserting said additional characters in a random fashion, the step of transmitting said additional characters at the same frequency as said received signals, and the step of preventing said receiving during said transmitting.

4,313,208
METHODS AND APPARATUS FOR TRANSMITTING ELECTROMAGNETIC RADIATION FOR ILLUMINATION AND COMMUNICATION

Frank E. Kavenik, Mundelein, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 9, 1979, Ser. No. 82,850
Int. Cl.³ H04B 1/10, 15/02
U.S. Cl. 455—42 **48 Claims**

11. In a method of transmitting electromagnetic radiation in a space for illumination and for communication of a signal having an alternating current component, the improvement comprising in combination the steps of:

modulating said signal on a radio frequency carrier;

providing a first antenna for emitting said modulated radio frequency carrier in said space;

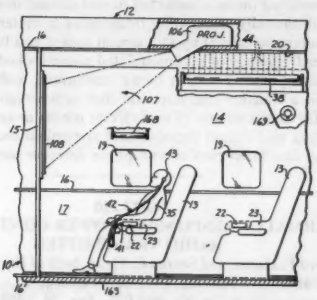
providing a second antenna for receiving said emitted radio frequency carrier;

providing a gas discharge lamp in said space;

shielding said gas discharge lamp against said radio frequency signals transmitted by said first antenna;

providing an alternating current having a frequency above the highest useful frequency of said alternating current component;

energizing said lamp with said alternating current for emitting light in said space; and



transmitting said radio frequency signals via said first and second antennas and said space having said gas discharge lamp provided and energized therein.

13. A method as claimed in claim 11, including the steps of:

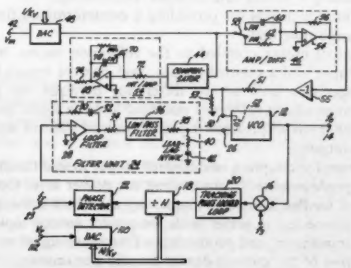
providing radio frequency signals within a predetermined wavelength range; and

confining the gas discharge in said lamp to a length shorter than one quarter of the shortest wavelength in said range.

4,313,209
PHASE-LOCKED LOOP FREQUENCY SYNTHESIZER INCLUDING COMPENSATED PHASE AND FREQUENCY MODULATION

Eric R. Drucker, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Jul. 14, 1980, Ser. No. 168,170
Int. Cl.³ H04B 1/04; H03C 3/02
U.S. Cl. 455—112 **11 Claims**



1. An improved modulated phase-locked loop system of the type including phase detector means having first and second input ports and an output port and controlled oscillator means for supplying an output signal at a frequency determined by a frequency control signal applied to a control terminal of said controlled oscillator means, said controlled oscillator output signal, coupling means responsive to a signal at a reference signal to provide said frequency control signal coupled to said first and second input ports of said phase detector means and said output port of said phase detector means being coupled to

said controlled oscillator control terminal, said modulated phase-locked loop including first and second modulation paths with said first modulation path supplying a modulation signal to said controlled oscillator control terminal and said second modulation path supplying said modulation signal to an input port of said coupling means; wherein the signal path coupling said output signal of said controlled oscillator means to said first input port of said phase detector includes circuit means having a transfer characteristic that varies as a function of the frequency of the output signal produced by said controlled oscillator means; and wherein said improvement comprises compensator means connected in said second modulation path for substantially eliminating differences in system modulation characteristic caused by said circuit means as a function of the carrier frequency of said modulated phase-locked loop system, said compensator means being configured and arranged to exhibit a transfer characteristic that substantially equals said transfer characteristic of said circuit means in said signal path coupling said output signal of said controlled oscillator means to said first input port of said phase detector means.

4,313,210

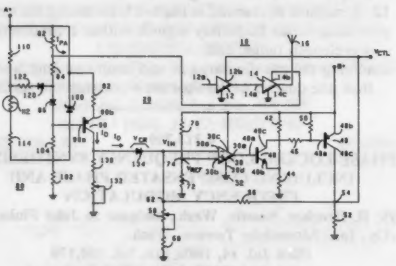
THERMALLY RESPONSIVE POWER CONTROL FOR A RADIO TRANSMITTER

Edward F. Hume, and Steven C. Hand, both of Fort Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 899,035, Apr. 24, 1978, abandoned. This application Jan. 31, 1980, Ser. No. 117,402

Int. Cl.³ H04B *1/04*

U.S. Cl. 455—117 **2 Claims**



1. A power control circuit for monitoring and controlling the power level of a radio frequency transmitter, said transmitter having a power source input, comprising:

reference means for providing a predetermined fixed reference potential,

control means coupled to the reference means, having an input and a control output, said control means being responsive only to the difference between the predetermined fixed reference potential and the signal received at its input to produce a predetermined control signal at its output;

means for coupling said control output to said transmitter for predeterminedly controlling the power level thereof;

first feedback means, comprising a current sensing resistor connected in series with the power source input of said transmitter and producing a first sense signal representative of the current drawn by said transmitter;

second feedback means for sensing the temperature of a predetermined portion of said transmitter and producing a second predetermined sense signal in response thereto; and

means for predeterminedly combining the first and second sense signals produced by said first and second feedback means, and coupling the combined signal to the input terminal of said control means,

whereby the control signal produced by said control means is determined solely by said first and second feedback signals.

4,313,211

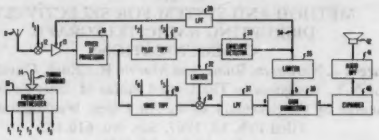
SINGLE SIDEBAND RECEIVER WITH PILOT-BASED FEED FORWARD CORRECTION FOR MOTION-INDUCED DISTORTION

Kenneth W. Leland, Howell, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 13, 1979, Ser. No. 65,957

Int. Cl.³ H04B *1/10*

U.S. Cl. 455—139 **34 Claims**



3. In a single sideband radio receiver for radio signals including phase and Rayleigh fading distortion effects, the signals including at least an information component and a pilot component, the improvement comprising

means (17) for separating said pilot signal component from the received radio signals, said separating means including a translating bandpass filter, and

means (38), responsive to the pilot component, for effecting forward gain correction of at least said Rayleigh fading effects in the information component of the received signals.

4,313,212

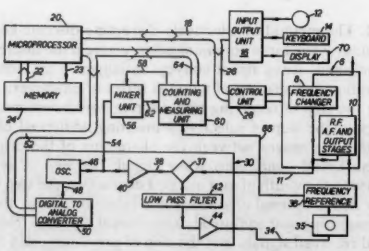
ELECTRICAL CIRCUIT ARRANGEMENTS, FOR EXAMPLE FOR USE WITH COMMUNICATIONS RECEIVERS

Ward P. Whitlock, Gaithersburg, Md., assignor to Racal Communications Inc., Rockville, Md.

Filed Aug. 31, 1978, Ser. No. 938,440

Int. Cl.³ H04B *1/26, 17/00*

U.S. Cl. 455—146 **7 Claims**



1. An electrical circuit arrangement for controlling the tuning of a communications receiver and for tuning it to a frequency offset by a predetermined increment from one of a plurality of standard tuning settings of the receiver, comprising

adjustable tuning means in the receiver settable to tune it to any one of the standard tuning settings whereby in each case to produce an intermediate frequency having the same standard frequency, and settable to tune it to a frequency offset by the predetermined increment from one of the standard tuning settings whereby in each case to produce an intermediate frequency having a frequency offset from said standard frequency by the predetermined increment,

frequency comparing means having first and second input means for respectively receiving two frequencies to be compared for equality,

means feeding a reference frequency to the first input means of the frequency comparing means,

frequency processing means having first and second input means,

means feeding the intermediate frequency of the communications receiver to the first input means of the frequency processing means,

variable oscillator means having a controllable output frequency,

means feeding the output frequency of the oscillator means to the second input means of the frequency processing means,

control means connected to control the output frequency of the oscillator means in dependence on the setting of the tuning means such that the output from the frequency processing means has a frequency which is equal to the said reference frequency when the value of the intermediate frequency is the standard frequency and when the value of the intermediate frequency is offset from the standard frequency by an amount equal to the said increment, and

means connected to the frequency processing means to feed the said output thereof to the second input means of the frequency comparing means, so that the frequency comparing means produces an output indicating equality of the two frequencies compared.

4,313,213
COMPUTER CONTROLLED TELEVISION RECEIVER WITH DISPLAY

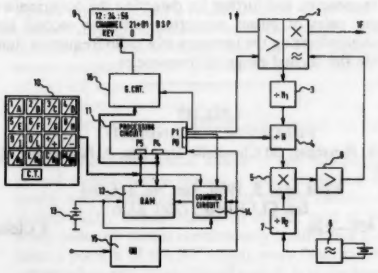
Attilio Farina, Torino, and Pietro Belisomi, Pinerolo, both of Italy, assignors to Italiana S.p.A. Indesit Industria Elettrodomestici, Italy

Filed Jun. 25, 1979, Ser. No. 51,944

Claims priority, application Italy, Jun. 26, 1978, 68491 A/78

Int. Cl.³ H04B *1/16*; H04N *5/50*

U.S. Cl. 455—158 **15 Claims**



1. Apparatus for use with a television receiver, said apparatus comprising:

(A) tuner means for tuning said television receiver to a frequency determined by a control signal applied thereto;

(B) display means for displaying visual information;

(C) control means operable in a direct selection tuning mode, a memory selection tuning mode and a memory display tuning mode;

(D) a keyboard including a plurality of keys, said keyboard enabling the operation of said television receiver to select the mode of operation of said control means and to enter frequency data indicative of the desired tuning frequency of said tuner means;

(E) memory means having a plurality of storage locations, each of said storage locations being capable of storing key information relating a respective one of said keys to a desired tuning frequency; and

(F) said control means being electrically connected to said tuner means, said display means, said keyboard and said memory means, said control means for:

(1) adjusting the value of said control signal to cause said tuner means to tune to a frequency determined by frequency data entered into said keyboard by the operator of said television receiver when said control means is operated in said direct selection tuning mode;

(2) adjusting the value of said control signal to cause said tuner means to tune to one of said tuning frequencies stored in said memory means when said control means is operated in said memory selection tuning mode;

(3) causing said display means to display memory information indicating which of said storage locations contains key information and which of said storage locations does not contain key information when said control means is operated in said memory display mode.

4,313,214
ELECTRONIC TUNING RADIO RECEIVER

Tatsuo Ito, Kobe, Japan, assignor to Fujitsu-Ten, Ltd., Kobe, Japan

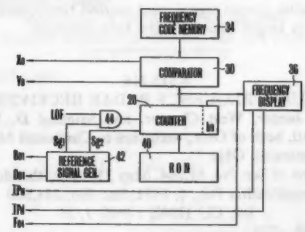
PCT No. PCT/JP79/00019, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO79/00570, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 29, 1979, Ser. No. 217,322

Claims priority, application Japan, Jan. 31, 1978, 53-10133; Jan. 31, 1978, 53-11429[U]

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—160 **7 Claims**

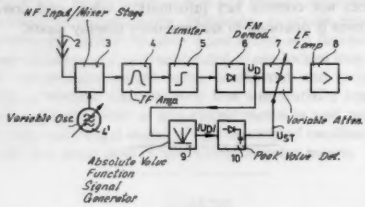


1. An electronic tuning radio receiver comprising a voltage variable reactance element tuning circuit including a local oscillator, a voltage memory for supplying a control voltage to said element, and a control circuit including a digital multiplexor, said control circuit providing an upward or a downward signal to said voltage memory in accordance with respective signals initiated by plural types of channel selection switches, a comparator for comparing the counted value of a counter counting the output frequency from said local oscillator and a frequency code selected by a digital channel selection switch to provide a comparison output signal to said control circuit, thereby causing said voltage memory to output a gradually increasing or decreasing control voltage, said receiver further comprising means for detecting that upon switching from a first frequency band to a second frequency band a frequency for reception during operation in the first band shifts to a frequency outside the second band and a circuit coupled to said control circuit for varying said control voltage to a value corresponding to a reception frequency within said second band in response to an output from said detection means.

4,313,215
CIRCUIT FOR ATTENUATING DISTURBING NOISE SIGNALS

Winfried Jansen, Hasloh, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1980, Ser. No. 127,712
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909520
Int. Cl.[3] H04B 1/10
U.S. Cl. 455—212 6 Claims

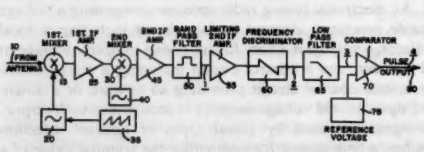


1. A circuit for attenuating noise signals in an FM receiver, having an FM-demodulator coupled to a variable attenuator having a control input, wherein the output signal from said FM-demodulator is also applied to an absolute value function signal generator having an output signal from which a control signal for said variable attenuator is derived, which controls signal increases the attenuation of said variable attenuator when the absolute value of the demodulator output signal rises above a threshold level, characterized in that said circuit further comprises means coupled to the control input of said variable attenuator for generating a variable control signal dependent on the absolute value of said demodulator output signal when said absolute value exceeds said threshold level, said control signal having a first and a second time constant associated respectively with an increase or a decrease in the the absolute value output signal, said second time constant being considerably larger than said first time constant.

4,313,216
DUAL FREQUENCY RADAR RECEIVER

James L. Jaeger, West Chester, and Michael D. Valentine, Cincinnati, both of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio

Continuation of Ser. No. 41,264, May 21, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,530
Int. Cl.[3] H04B 17/00, 1/26
U.S. Cl. 455—226 2 Claims



1. Apparatus for detecting the presence of continuous or pulsed radio frequency signals occurring within either a first or a second range of frequencies, including:

means for receiving said radio frequency signals occurring within either a first or a second frequency range,

a first local oscillator;

first mixer means having one input connected to said receiving means and another input connected to said first local oscillator for mixing said signals in the first frequency range with one harmonic of said local oscillator to produce an output at a first intermediate frequency, and for mixing said signals in the second frequency range with another harmonic of said local oscillator also to produce an output at said intermediate frequency,

a second local oscillator,

second mixer means including one input connected to the output of said first mixer means and another input connected to said second local oscillator for producing an output at a second intermediate frequency,

means for varying the frequency of said first local oscillator,

frequency-to-voltage converter means responsive to the output of said second mixer means and having a response bandwidth less than the first and second range of frequencies for converting said second intermediate frequency signals to a voltage which changes at a rate proportional to the rate of change of frequency within said response bandwidth,

low pass filter means connected to the output of said converter means for reducing the noise component output thereof, the maximum frequency of said low pass filter being several times less than the response bandwidth of said converter means;

comparator means coupled to the output of said low pass filter means and to a reference voltage, said reference voltage being set at a level above the noise output of said low pass filter whereby an output is obtained from said comparator means as said converter means provides an output indicating the presence of radio frequency signals within either the first or second range of frequencies,

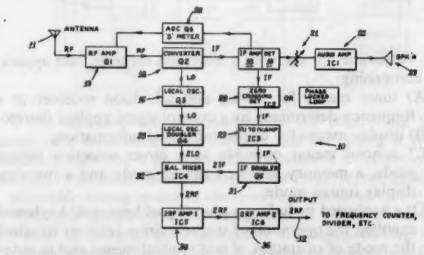
wherein said means for varying the frequency of said first local oscillator changes the intermediate frequency over a range sufficiently large and at a rate fast enough that any radio frequency signal occurring within the first or second range of frequencies will fall within the response bandwidth of said converter means after mixing; and

detecting means responsive to the output of said comparator means for detecting the occurrence of output pairs of pulses occurring within a first time interval indicating the presence of a radio frequency signal within the first range of frequencies, and further for detecting the occurrence of output pairs of pulses occurring within a second time interval indicating the presence of a radio frequency signal within the second range of frequencies.

4,313,217
FREQUENCY STANDARD

Donald A. Beuscher, 30 Chandelle Dr., Rte. 3, Hampshire, Ill. 60140

Filed May 5, 1980, Ser. No. 146,644
Int. Cl.[3] H04B 17/00, 1/26
U.S. Cl. 455—226 8 Claims



1. A frequency standard operable to provide an output signal at a frequency which is directly proportional to the frequency of a radiated radio frequency signal, comprising:

means for receiving the radio frequency signal;

means for generating a signal at a local oscillator frequency;

means for mixing the radio frequency and local oscillator signals in order to derive a signal at an intermediate frequency;

means for scaling the frequencies of each of the local oscilla-

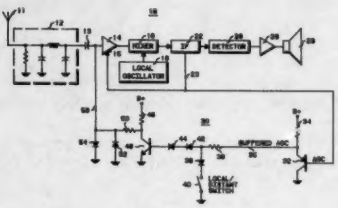
tor and intermediate frequency signals by the same integer factor other than unity; and

means for mixing the frequency-scaled local oscillator and intermediate frequency signals in order to obtain the output signal.

4,313,218
EXTENDED AGC FOR A RADIO RECEIVER

John J. O'Donnell, Jr., Arlington Heights, and Kenneth S. Hutchinson, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 8, 1980, Ser. No. 176,310
Int. Cl.³ H04B *00/00*
U.S. Cl. 455—239 **4 Claims**



1. An extended automatic gain control circuit for a tunable radio receiver, said radio receiver including means for coupling RF signals from an antenna to an RF input portion of said receiver, said receiver providing an automatic gain control signal on an AGC line which is related in magnitude to the magnitude of the RF signal to which the radio receiver is tuned, said extended automatic gain control circuit comprising:

at least one semiconductor means connected to said coupling means, said semiconductor means adapted to limit any RF signals which exceed a predetermined level; and

extended AGC circuit means responsive to the AGC signal on said AGC line to render said least one semiconductor means continuously conductive to shunt at least a portion of said RF signal away from said radio receiver when said AGC signal is indicative of a high RF signal level to provide an extended, effective AGC range for said radio receiver;

said extended AGC circuit means further including local/-distant switch means having a local mode and a distant mode, said local/distant switch means causing said extended AGC circuit means to render said at least one semiconductor means continuously conductive to shunt at least a portion of the RF signal away from the radio receiver when said local/distant switch is in the local mode.

4,313,219
RECEIVER FOR HIGH FREQUENCY ELECTROMAGNETIC OSCILLATIONS HAVING A FREQUENCY READJUSTMENT

Egmont Gabler, Munich, and Uwe Lehmann, Dachau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,392
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913172
Int. Cl.³ H04B *1/26*; H03D *3/02*
U.S. Cl. 455—260 **4 Claims**

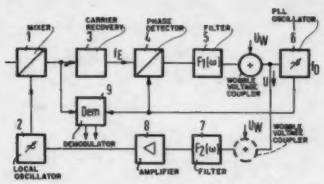
1. A receiver for high frequency electromagnetic oscillations, comprising:

an input for receiving a modulated carrier, including a mixer having a local-oscillator input;

a phase control loop connected to the output of said mixer;

a frequency control loop connected between said phase control loop and said local oscillator input of said mixer;

said phase control loop comprising a carrier recovery circuit connected to said mixer for providing a recovered carrier, a phase detector connected to said carrier recovery circuit, a first filter connected to said phase detector, control loop capture means connected to said first filter and for additionally injecting a separate wobble signal, a first variable frequency oscillator connected to said control loop capture means and controlled by the wobble signal and by the filtered output signal of said phase detector to restore the carrier, and a demodulator connected to said first variable frequency oscillator and to said mixer for demodulating the output signals of said mixer;



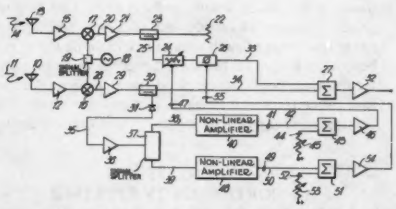
said phase detector connected to said first oscillator to receive the restored carrier for determining the phase between the recovered carrier and the restored carrier; and

said frequency control loop comprising a second filter connected to said control loop capture means, a controlled gain amplifier connected to said second filter and a second variable frequency oscillator as a local oscillator electrically connected between said controlled gain amplifier and said local oscillator input of said mixer.

4,313,220
CIRCUIT AND METHOD FOR REDUCING POLARIZATION CROSSTALK CAUSED BY RAINFALL

Gerald J. P. Lo; Wayne L. Nowland, and Anthony N. Shelton, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 3, 1978, Ser. No. 882,999
Claims priority, application Canada, Jan. 23, 1978, 295471
Int. Cl.³ H04B *7/10*
U.S. Cl. 455—304 **12 Claims**



1. In a circuit for reducing the effects of polarization crosstalk occurring on a first RF signal due to a second RF signal, wherein said first and second RF signals are two approximately orthogonally polarized RF signals having essentially the same frequency, and wherein, after reception by suitable antenna means said first RF signal follows a first signal path including both RF and IF sections, and said second RF signal follows a second signal path including both RF and IF sections; a portion of the signal in said second signal path is passed through the series combination of a variable attenuator and a variable phase shifter, and the resultant signal is added to said first signal path so as to at least partially cancel portions of signal from said second signal path that appear superimposed upon the signal of said first signal path, said circuit characterized by: logic means for controlling both said variable attenuator and said variable phase shifter in a predetermined manner in response to the magnitude of one of said RF signals.

4,313,221
MIXER/OSCILLATOR CIRCUIT

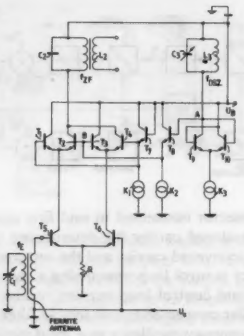
Johann Mattfeld, Unterheinriet, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 139,114

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929918

Int. Cl.³ H04B 1/28

U.S. Cl. 455—319 **2 Claims**



1. A mixer/oscillator circuit comprising:

a four-quadrant mixer stage having a first input connected to receive a signal to be mixed and a second input and composed of four transistors each having a collector electrode, a base electrode and an emitter electrode, said transistors being arranged in pairs with said emitter electrodes of each pair being connected together, and said base electrode of one transistor of each pair being connected to said second input;

an oscillator stage generating an alternating signal and having an output at which that alternating signal appears;

an emitter follower having a collector electrode and connected between said oscillator stage output and said second input of said mixer stage; and

a base-emitter diode connected between said emitter follower collector electrode and said base electrode of the other transistor of each said pair, said diode being poled to be conductive in its forward direction between said emitter follower collector electrode and said base electrode of said other transistor of each said pair for setting the d.c. voltage at said base electrodes of said other transistors.

4,313,222
H-F PORTION OF TV RECEIVER

Walter Katthän, Hildesheim, Fed. Rep. of Germany, assignor to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 149,028

Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921219

Int. Cl.³ H04B 1/26

U.S. Cl. 455—319 **3 Claims**

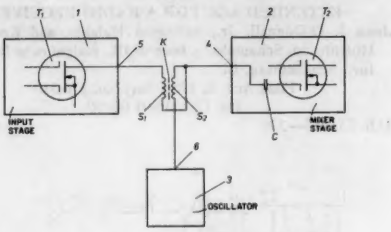
1. A high-frequency amplifier-mixer stage for radio or television receivers having an input stage, a local oscillator and a mixer stage to which the outputs of said input stage and said oscillator are applied as inputs, and comprising the improvement which consists in that:

first and second coils wound together bifilarly are used for coupling the outputs of said input stage and of said oscillator to the input of said mixer stage;

an input terminal (4) of said mixer stage (2) is connected through said first coil (S_1) to an output terminal (5) of said input stage (1);

said input terminal (4) of said mixer stage (2) is connected through said second coil (S_2) to an output terminal (6) of said oscillator (3);

the respective signal paths from said output terminals (5,6) of said input stage (1) and said oscillator (3) to said input terminal (4) of said mixer stage through said first and



second coils (S_1, S_2) have opposed winding directions, and

none of said terminals (4,5,6) is connected to ground or to a reference potential that is fixed with respect to ground potential.

4,313,223
SIGNAL-AMPLIFICATION FREQUENCY-CONVERSION APPARATUS HAVING A COMMON ACTIVE COMPONENT

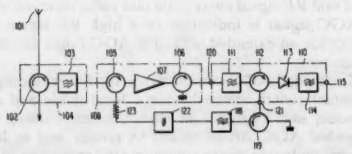
Kazuo Sakamoto, and Takeshi Hayasaka, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,888

Claims priority, application Japan, Feb. 6, 1979, 54-12580; Mar. 28, 1979, 54-36493; Mar. 28, 1979, 54-36495

Int. Cl.³ H04B 1/26

U.S. Cl. 455—323 **14 Claims**



1. A frequency-conversion apparatus adapted to frequency-mix a signal of a first frequency and a signal of a second frequency for frequency conversion to a signal of a third frequency, said frequency-conversion apparatus comprising

an input section to which said first-frequency signal is supplied;

amplifier means supplied with the output of said input section and with said second-frequency signal for amplifying both said first- and second-frequency signals;

frequency-mixer means having a nonlinear element supplied with the amplified first- and second-frequency signals from the output of said amplifier means for frequency-mixing said first- and second-frequency signals to provide said third-frequency signal, said nonlinear element being set to cause a part of said second-frequency signal to be reflected as a reflection component; and

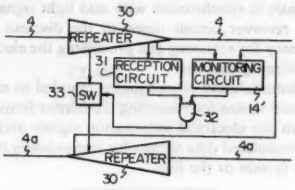
positive feedback means for supplying said reflection component to said amplifier means to drive said amplifier means into a frequency-selective oscillation state at said second frequency, wherein the level of said reflection component is so set as to make said amplification and said frequency-selective oscillation by said amplifier means remain in the region where said amplifier means exhibits linear input-output characteristics.

4,313,224

MONITORING SYSTEM OF AN OPTICAL POWER IN AN OPTICAL REPEATER

Hiroharu Wakabayashi, Kawasaki, and Yasuhiko Niiro, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 5, 1980, Ser. No. 146,687
Claims priority, application Japan, May 17, 1979, 54-59743
Int. Cl.³ H04B 9/00
U.S. Cl. 455—601 5 Claims



1. A monitoring system of an optical power in an optical repeater in an optical transmission system having a pair of terminal stations, a plurality of upward and downward repeaters inserted between said terminal stations through an upward optical fiber cable and a downward optical fiber cable, each of said repeaters having at least an optical-electrical conversion element for the conversion of the input optical energy to the electrical energy, an amplifier for amplifying the electrical output of said conversion element, an electrical-optical conversion element for converting the electrical output of said amplifier to an optical energy which is transmitted to an output optical fiber cable, means for controlling the optical output of said electrical-optical conversion element, and a switch means for providing the signal return path between the upward circuit to the downward path, in each transmission direction,

characterized in that;

each of said repeaters further comprises of a monitoring circuit having a reference voltage generator for providing a reference level which is lower than the normal signal level when the signal has the mark ratio of ½, and a comparator for comparing the optical output power of said electrical-optical conversion element with said reference level, and means for transferring the monitored result to one of the terminal stations, whereby one of the terminal stations designates the particular repeater to close said switch to provide a signal return path, transmitting a test signal adjusting the mark ratio of the same, until the optical output power of the electrical-optical conversion element becomes equal to the reference level.

4,313,225

OPTO-ISOLATOR HYBRID CIRCUIT

Robert L. Carbrey, Boulder, and James E. Dalley, Brighton, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

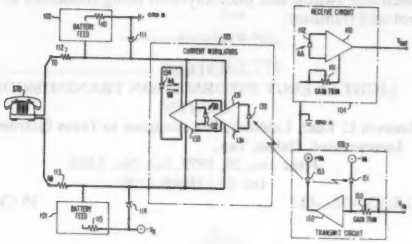
Filed Nov. 5, 1979, Ser. No. 91,385
Int. Cl.³ H04B 9/00
U.S. Cl. 455—602 13 Claims

1. A bidirectional coupler circuit having a first set (T0, R0) and a second set (V_{IN}, V_{OUT}) of terminals for providing unidirectional signal transmission from said first set (T0, R0) of terminals to said second set (V_{IN}, V_{OUT}) of terminals and from said second set ($V_{IN}V_{OUT}$) of terminals to said first set (T0, R0) of terminals comprising:

first light emitting means (134, 239–41, 248–54) connected to said first set of terminals (T0, R0) and responsive to a first set of electrical signals appearing thereon for generating light emissions representative of said first set of electrical signals;

first light detecting means (104) optically coupled to said first light emitting means (134, 230–41, 248–54), connected to a first one of said second set of terminals (V_{OUT}) and responsive to said light emissions for converting said light emissions to electrical signals representative of said first set of electrical signals and for applying said electrical signals representative of said first set of electrical signals to said first one of said second set of terminals (V_{OUT});

reverse transmission means (130, 131, 105) connected to both said first set (T0, R0) and a second one of said second set (V_{IN}) of terminals and responsive to a second set of electrical signals appearing on said second one of said second set of terminals (V_{IN}) for applying said second set of electrical signals to said first set of terminals (T0, R0);



wherein said first light emitting means (134, 239–41, 248–54) are also responsive to said second set of electrical signals appearing on said first set (T0, R0) of terminals for generating light emissions representative of said second set of electrical signals; and

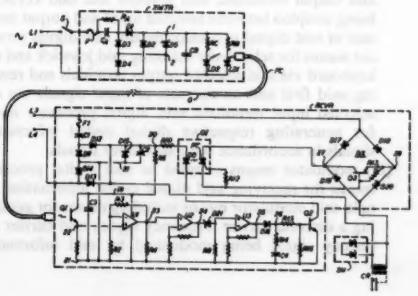
feedback means (234, 242) connected both to said first light emitting means (134, 239–41, 238–54) and to said reverse transmission means (130, 131, 105), and responsive to said reverse transmission means (130, 131, 105) applying said second set of electrical signals to said first light emitting means (134, 239–41, 248–54) for preventing said first light emitting means (134, 239–41, 248–54) from generating light emissions representative of said second set of electrical signals.

4,313,226

FIBER OPTIC CONTROL APPARATUS

Paul A. Blackington, Afton, N.Y., assignor to Sheltered Workshop for the Disabled, Inc., Binghamton, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,178
Int. Cl.³ H04B 9/00
U.S. Cl. 455—603 16 Claims



1. Control signal transmission apparatus for energizing and de-energizing a load at a first location in response to operation of a switch at a second location, comprising, in combination: an optical fiber extending between said first and second locations;

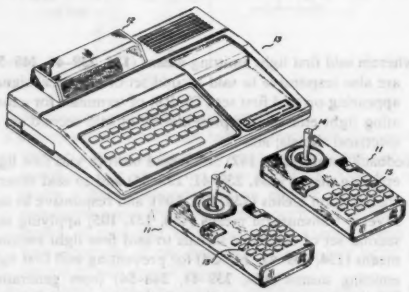
a transmitter located at said second location to be operated by said switch to selectively apply light pulses to said optical fiber; and a receiver located at first location and operable to energize said load in response to reception of light pulses from said optical fiber, said receiver comprising a photosensor operable to receive said light pulses from said optical fiber and to provide a first signal voltage, amplifier means for amplifying said signal voltage to provide a second signal voltage, an opto isolator comprising a light-emitter and a photothyristor operated by light from said light-emitter, means responsive to said second signal voltage for energizing said light emitter to turn on said photothyristor, an electronic switch connected in series with said load and including a transistor to open and close said electronic switch, said photothyristor being connected to control said transistor.

4,313,227

LIGHT ENERGY INFORMATION TRANSMISSION SYSTEM

Kenneth C. Eder, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 29, 1979, Ser. No. 7,056
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 **35 Claims**



1. A light-emitting system for information transmission comprising:

(a) at least one portable control unit including:

(i) a digital joystick movable along an X-axis and a Y-axis for generating a first set of digital input signals indicative of the incremental position of said joystick along the X-axis and along the Y-axis;

(ii) a keyboard having a plurality of key switches for generating a second set of digital input signals indicative of the respective states of the key switches;

(iii) a digital processor means having a plurality of input and output terminals, said joystick and said keyboard being coupled between selected input and output terminals of said digital processor means, said digital processor means for selectively scanning said joystick and said keyboard via said selected output terminals and receiving said first and second sets of input signals via said selected input terminals, said digital processor means for generating respective digital coded information signals in accordance with said input signals;

(iv) modulator means coupled to said digital processor means for receiving said digital coded information signals, said modulator means including means for generating a discrete carrier frequency signal, said carrier frequency signal being modulated by said information signals to provide modulated information signals for transmission; and

(v) a light-emitting device coupled to said modulator means for receiving said modulated information signals, said light-emitting device transmitting coded light signals in synchronism with said modulated information signals; and

(b) a receiver module including:

(i) a photodetector device for altering an electrical signal in accordance with the light signals received from said light-emitting device to provide electrical information signals in synchronism with said light signals;

(ii) a receiver circuit tuned to the discrete carrier frequency for receiving and processing the electrical information signals; and

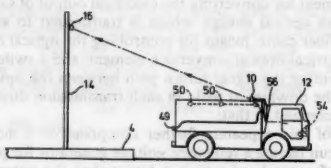
(iii) demodulation circuit means coupled to said receiver circuit means for removing the carrier frequency signal from the electrical information signals and generating demodulated data signals for transmission to a computing system or the like.

4,313,228

WIRELESS LINK BETWEEN VEHICLES AND A STATIONARY INSTALLATION

Patrick Berstein, Thornhill, Canada, assignor to Imperial Oil Limited, Toronto, Canada

Filed Jan. 23, 1980, Ser. No. 114,718
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 **14 Claims**



1. A communication link between a land vehicle and a stationary vehicle service installation in respect of which vehicles are required to assume a restricted range of locations, said link including an optical transmitter mounted on the vehicle at approximately a first height above grade and comprising a modulatable source of submillimetric electromagnetic radiation and means restricting radiation from said source to a comparatively narrow angle in a first dimension and a comparatively wide angle in a second dimension, an optical receiver mounted in a fixed position relative to said stationary installation at a second substantially different height above grade and comprising a sensor responsive to radiation from said source and means concentrating on said sensor radiation from said source received in a comparatively narrow angle in said first dimension and a comparatively wide angle in said second dimension, said receiver being directed so that its field of view includes all possible locations of the transmitter on the vehicle when located anywhere in said range of locations, and said transmitter being oppositely directed relative to the vehicle whereby to establish an optical path between said source and said sensor when the vehicle is anywhere in said range of locations.

DESIGN PATENTS

GRANTED JAN. 26, 1982

ERRATA

For CLASS	See PATENT NO.
D32-070	262,771

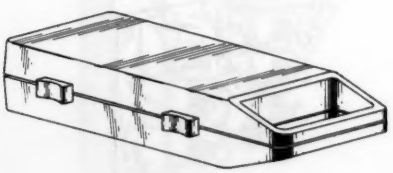
DESIGNS

JANUARY 26, 1982

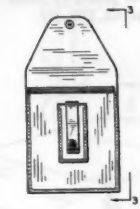
262,750
SHOE
Renate M. Melzi, and Edward R. Melzi, both of 3310 Ivanhoe La., Garland, Tex. 75042
Filed Sep. 14, 1979, Ser. No. 75,819
Term of patent 7 years
Int. Cl. D2—*04*
U.S. Cl. D2—283

262,751
ATHLETIC SHOE
Wolf Anderie, Strasbourg, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France
Filed Jan. 11, 1979, Ser. No. 2,763
Claims priority, application France, Jul. 13, 1978, 78 444
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D2—310

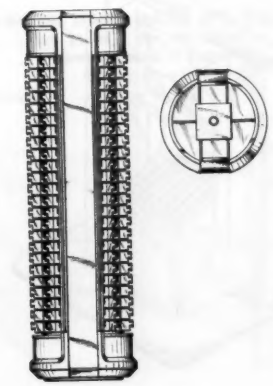
262,752
CASSETTE CARRYING CASE
Pasquale L. Pepicelli, Jr., Chelmsford; Alan Lowry, Canton, both of Mass.; David Roche, Nashua, N.H., and Gregory Mathus, Concord, Mass., assignors to Data Packaging Corporation, Cambridge, Mass.
Filed Dec. 13, 1979, Ser. No. 103,052
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



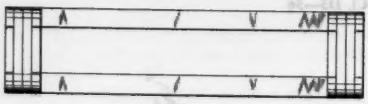
262,753
CLIP-ON WATERPROOF POUCH FOR A WALLET
Terrence S. Salata, 5831 Livernois, Detroit, Mich. 48210
Filed Mar. 13, 1979, Ser. No. 20,212
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—56



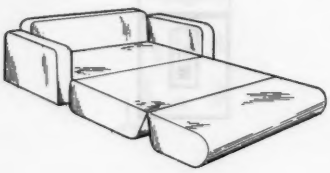
262,754
EYEGLASS DISPLAY RACK
Milton J. Merl, New City, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.
Filed Dec. 28, 1979, Ser. No. 107,910
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—28



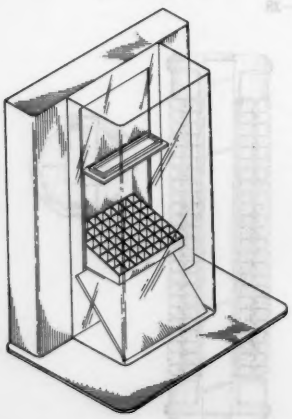
262,755
BENCH
Joseph E. Kinnebrew, IV, 13300 Beckwith Dr., NE., Lowell, Mich. 49331
Filed Mar. 27, 1979, Ser. No. 24,317
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—58



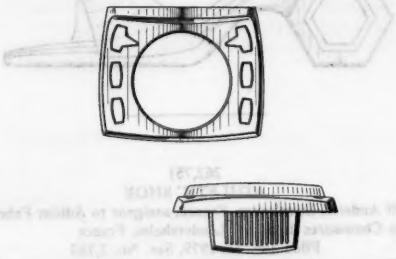
262,756
CONVERTIBLE SOFA
Harry R. Tiffany, III, Spring City, Tenn., assignor to Robert Tiffany Designs, Inc., Chattanooga, Tenn.
Filed Jan. 29, 1979, Ser. No. 7,388
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



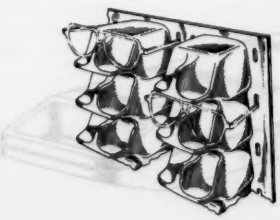
262,757
DISPLAY CASE
Theodore R. Stiles, Basking Ridge, and Alan Abramson, Upper Montclair, both of N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Sep. 24, 1979, Ser. No. 78,543
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85



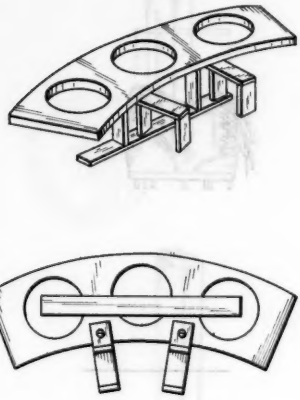
262,758
WALL MOUNTED HOLDER FOR BATHROOM-ACCESSORIES
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,357
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—92



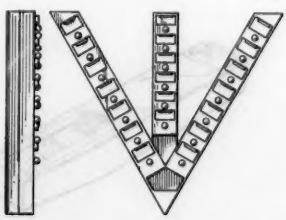
262,759
EYEGLASS FRAME DISPLAY RACK
Francis E. Caldwell, 3905 Chimney Rock Rd., Plano, Tex. 75075, and Robert E. Hagan, P.O. Box 3986, Irving, Tex. 75061
Filed Oct. 2, 1978, Ser. No. 947,718
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—114



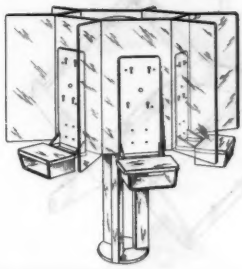
262,760
BEVERAGE CONTAINER HOLDER ATTACHMENT FOR A HOT TUB
Robert W. Adams; Ellen Newton, both of 10827 Woodbine St., Los Angeles, Calif. 90034, and Frederick E. Stansberry, 4700 Sandyland Rd., Apt. #12, Carpinteria, Calif. 93013
Filed Dec. 17, 1979, Ser. No. 104,040
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—93



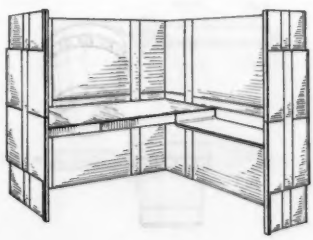
262,761
VITAMIN PILL CABINET
Leon Young, 541 Oakside Dr., SW., Atlanta, Ga. 30331
Filed Dec. 21, 1979, Ser. No. 106,109
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129



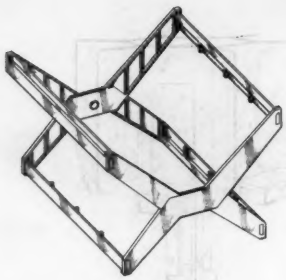
262,762
TELEPHONE ENCLOSURE
John N. McGarvey, Delaware County, Pa., and Lajos Novak, Bergen County, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed Oct. 23, 1978, Ser. No. 954,022
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—157



262,763
DESK UNIT OR SIMILAR ARTICLE
Lawrence Lerner, New York, N.Y., and Fred Schmitt, Nutley, N.J., assignors to Litton Business Systems, Inc., Burlington, Iowa
Division of Ser. No. 770,328, Feb. 22, 1977. This application Jun. 21, 1979, Ser. No. 50,885
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

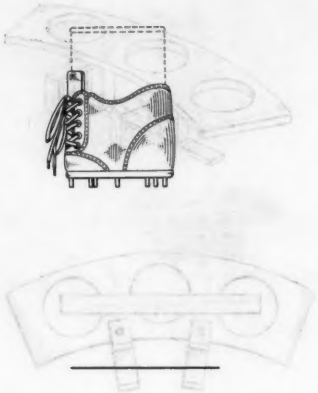


262,764
HANGING FILE RACK
Stephen T. Meyer, Carmel, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.
Filed Feb. 22, 1979, Ser. No. 13,962
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181

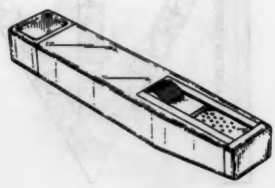


262,765
CUP
Bryan E. C. Lack, Banbury, and Robert E. Coles, Leamington Spa, both of England, assignors to General Foods Ltd., Oxfordshire, England
Filed Jun. 1, 1979, Ser. No. 44,537
Claims priority, application United Kingdom, Feb. 2, 1979, 988387
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—14

262,766
JACKET-TYPE COASTER
M. Dean Hayden, Jr., 3937 S. 500 East, Salt Lake City, Utah 84107
Filed Aug. 6, 1979, Ser. No. 64,295
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—45

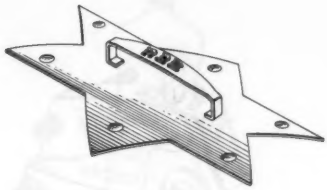


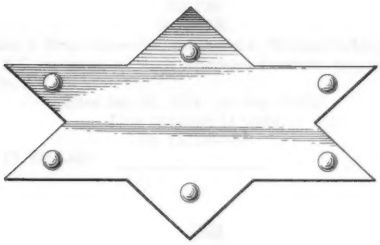
262,767
CONDIMENT DISPENSER
Thomas Bovet, Hong Kong, Hong Kong, assignor to Mike & Kremmel Limited, Kowloon, Hong Kong
Filed Oct. 22, 1979, Ser. No. 87,111
Claims priority, application United Kingdom, Sep. 10, 1979, 991492/79
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54



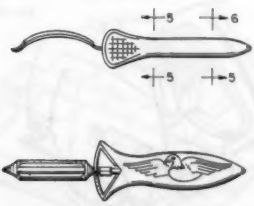
262,768
CONDIMENT DISPENSER
Thomas Bovet, Hong Kong, Hong Kong, assignor to Mike & Kremmel Limited, Kowloon, Hong Kong
Filed Feb. 4, 1980, Ser. No. 118,157
Claims priority, application United Kingdom, Nov. 29, 1979, 992591/79
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—54

262,769
SABBATH BREAD LOAF HOLDER
Charles C. Hoffberger, 1715 N. Lake Shore Dr., Sarasota, Fla. 33581
Filed Nov. 8, 1979, Ser. No. 92,326
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—99



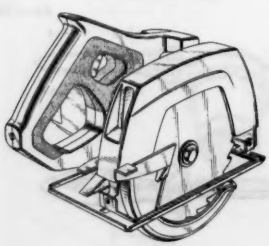


262,770
VEGETABLE PEELER
Harry Propalis, Jr., 5931 Bertram Ave., Baltimore, Md. 21214
Filed Jul. 18, 1978, Ser. No. 925,830
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—147

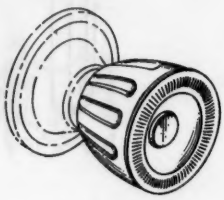


262,771
STEAM IRON
Thomas E. Hanson, Phoenixville, Pa., assignor to SCM Corporation, New York, N.Y.
Filed Mar. 16, 1979, Ser. No. 20,901
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—70

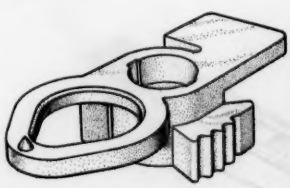
262,772
PORTABLE CIRCULAR SAW
James L. Glass, Liberty; Harvey C. Rettberg, Pickens; Richard N. Ryer, II, Cleveland, and James R. Sistare, Pickens, all of S.C., assignors to The Singer Company, Stamford, Conn.
Filed Jan. 22, 1980, Ser. No. 114,444
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—66



262,773
DOOR KNOB
Brian Wansbrough, Canterbury, and Harold F. Munro, Ringwood, both of Australia, assignors to Gainsborough Hardware Industries Pty. Limited, Victoria, Australia
Filed Jan. 18, 1980, Ser. No. 113,252
Claims priority, application Australia, Jul. 20, 1979, 78475
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—312

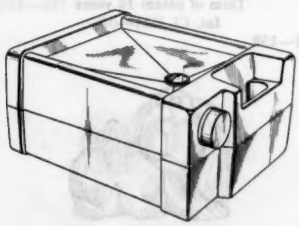


262,774
TWIST LOCK HANGER
Robert S. Wallace, Los Angeles, Calif., assignor to Dan F. Wallace, Kailua-Kona, Hi.
Filed Aug. 20, 1979, Ser. No. 67,829
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373



262,775
VIBRATION ISOLATOR OR SIMILAR ARTICLE
Daniel T. Lilley, Jr., Indianapolis, Ind., assignor to E-A-R Corporation, Indianapolis, Ind.
Filed Aug. 23, 1979, Ser. No. 68,980
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—402

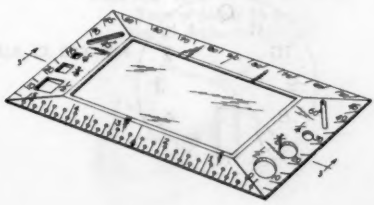
262,776
CONTAINER FOR LIQUIDS
Kiyoshi Sandow, P.O. Box 24158, Houston, Tex. 77029
Filed Oct. 22, 1979, Ser. No. 87,083
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376



262,777
BOTTLE
William J. Britt, Greenville, and Daniel C. Wilson, Taylors, both of S.C., assignors to Morton-Norwich Products, Inc., Greenville, S.C.
Filed Sep. 28, 1979, Ser. No. 79,670
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—383

262,778
BOTTLE
William J. Britt, Greenville, and Daniel C. Wilson, Taylors, both of S.C., assignors to Morton-Norwich Products, Inc., Greenville, S.C.
Filed Sep. 28, 1979, Ser. No. 79,673
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—404

262,779
GEOMETRICAL INSTRUMENT
David Yeeda, 6531 Dykes Way, Dallas, Tex. 75230
Filed Jan. 7, 1980, Ser. No. 109,962
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—61

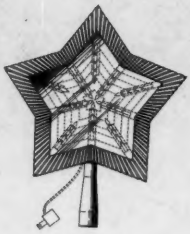


262,780
TIMEPIECE FACE
John S. Maliskas, Newtown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Sep. 12, 1979, Ser. No. 75,284
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

262,781
TIMEPIECE FACE
John S. Maliskas, Newtown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Sep. 12, 1979, Ser. No. 75,285
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

262,782
TIMEPIECE FACE
John S. Maliskas, Newtown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Sep. 12, 1979, Ser. No. 75,286
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

262,783
CHRISTMAS DECORATION
Jack Burnbaum, Newton, Mass., assignor to Bradford Novelty Co., Inc., Boston, Mass.
Filed Feb. 29, 1980, Ser. No. 125,903
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—124



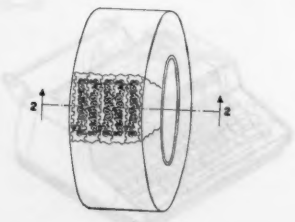
262,784
FIGURINE OF AN ORANGUTAN
Jesús A. Carbajalas Santa Eulalia, and Javier B. Carbajales Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co. Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 969,950
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

262,785
FIGURINE OF A BASSET PUP
Jesús A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed Oct. 4, 1979, Ser. No. 81,906
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

262,786
FIGURINE OF A DACHSHUND
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Oct. 4, 1979, Ser. No. 81,909
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

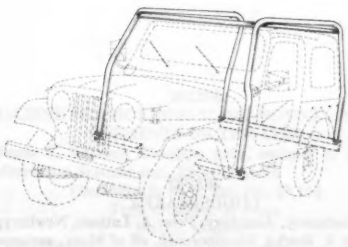
262,787
FIGURINE OF A CHIHUAHUA
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co. Inc., Laguna Hills, Calif.
Filed May 29, 1980, Ser. No. 154,589
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

262,788
TIRE
Joseph B. Nadler, 7657 Greenland Pl., Cincinnati, Ohio 45237
Filed Feb. 14, 1979, Ser. No. 11,795
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—137

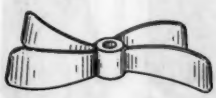


262,789
SAFETY DEVICE FOR SELF PROPELLED LAND VEHICLES
Howard E. Dunn, 17 Barnes Crescent, Ottawa, Ontario, Canada (K2H 7C1)
Filed Dec. 7, 1978, Ser. No. 967,404
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

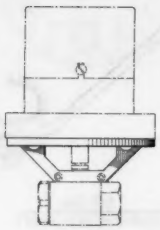
262,790
CHASSIS MOUNTED SUPERSTRUCTURE CARRYING FRAME FOR SOFT-TOP VEHICLES
Gerard J. Bernier, P.O. Box 504, 14 Middle St., Brunswick, Me. 04011
Filed Aug. 23, 1978, Ser. No. 936,001
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



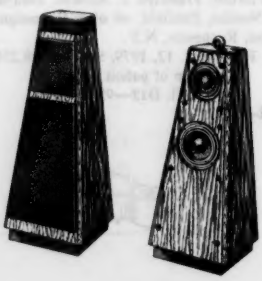
262,791
GLASS COATED IMPELLER
Vincent J. Piarulli; Franklyn J. Amorse, both of Greece, and Erwin J. Nunlist, Penfield, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Mar. 12, 1979, Ser. No. 19,291
Term of patent 14 years
Int. Cl. D12—*99*; D7—*04*
U.S. Cl. D12—214



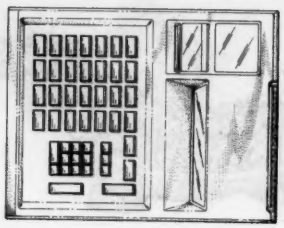
262,792
MOUNTING BASE FOR MOTOR OPERATED VALVE
Myron D. Markley, 126 Winthrop Ter., Meriden, Conn. 06450, and Joseph M. Markley, River Rd., Essex, Conn. 06426
Filed Dec. 7, 1979, Ser. No. 101,085
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—1



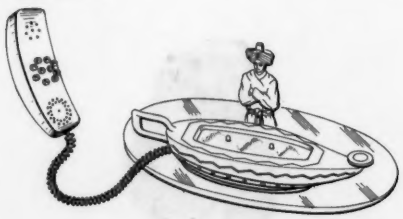
262,793
LOUDSPEAKER
Dana B. Hathaway, Amesbery; Peter A. Latham, Newburyport, and Paul E. Brefka, Southborough, all of Mass., assignors to Epicure Products, Inc., Newburyport, Mass.
Filed Sep. 11, 1979, Ser. No. 74,528
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



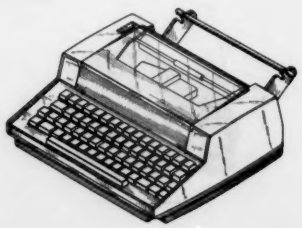
262,794
MANAGEMENT ACTION TERMINAL
Charles B. Dreyer, and John R. Frassanito, both of San Antonio, Tex., assignors to Transaction Control Industries, Bryan, Tex.
Filed Jul. 20, 1979, Ser. No. 59,483
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



262,795
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Jun. 11, 1979, Ser. No. 47,161
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

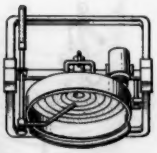


262,796
TELEPRINTER
Robert C. Hoffman, Park Ridge, Ill., assignor to Qwint Systems, Inc., Northbrook, Ill.
Filed Jan. 16, 1980, Ser. No. 112,161
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—93

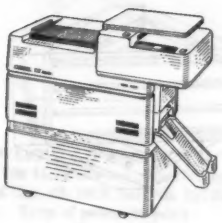


262,797
SNOW THROWER
Richard P. Arthur, Darien; Joseph V. Rund, Wheaton, and Joseph R. Mango, Midlothian, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jun. 3, 1980, Ser. No. 156,008
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—12

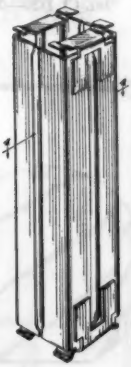
262,798
PANNING MACHINE
Eric W. Oldendorf, Venice, Calif., assignor to Goldhound International, Inc., Marina del Rey, Calif.
Filed Dec. 29, 1980, Ser. No. 220,298
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—21



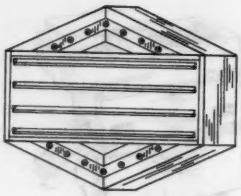
262,799
ELECTRONIC COPIER
Norbert Schlagheck, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Sep. 7, 1979, Ser. No. 73,547
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 5 MR 555-G 160
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



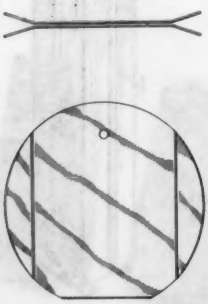
262,800
MAGAZINE FOR HOLDING SLIDE MOUNTS FOR FILM SEGMENTS OR THE LIKE
DeWayne E. Karcher, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.
Filed May 8, 1979, Ser. No. 37,186
Term of patent 3½ years
Int. Cl. D16—*05*
U.S. Cl. D16—38



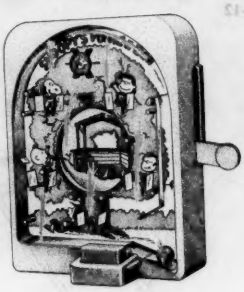
262,801
ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Dec. 13, 1979, Ser. No. 103,179
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



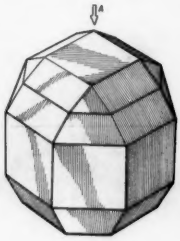
262,802
CARDHOLDER
Carl J. Ylvisaker, Rte. 3, Box 292 G, Hillsboro, Oreg. 97123, and Paul E. Ylvisaker, 407 Jefferson St., Sisters, Oreg. 97759
Filed Oct. 22, 1979, Ser. No. 86,930
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42



262,803
PIN BALL GAME MACHINE
Sidney Tepper, 24 Edgewood Ter., Millburn, N.J. 07041
Filed Aug. 20, 1979, Ser. No. 68,164
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12



262,804
LOTTERY DIE
James V. Gleason, Box 158, Keisterville, Pa. 15449
Filed Apr. 16, 1979, Ser. No. 30,489
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



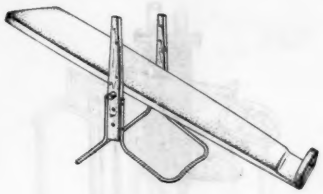
262,805
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Sep. 4, 1979, Ser. No. 72,511
Claims priority, application Japan, Apr. 6, 1979, 54-14090
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—102

262,806
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Sep. 4, 1979, Ser. No. 72,532
Claims priority, application Japan, Apr. 6, 1979, 54-14088
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—104

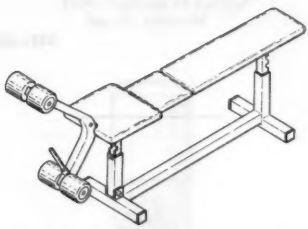
262,807
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Oct. 24, 1979, Ser. No. 88,206
Claims priority, application Japan, Aug. 30, 1979, 54-36427
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—102

262,808
EXERCISE DEVICE
Han C. Kyo, 7558 N. Rockwell, Chicago, Ill. 60659
Filed Jan. 10, 1979, Ser. No. 2,255
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

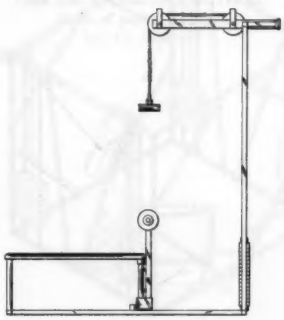
262,809
SLANT BOARD
Walter D. Rossow, and Robert W. Rossow, both of 89 Hazardville Rd., Longmeadow, Mass. 01106
Filed Dec. 14, 1979, Ser. No. 103,603
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



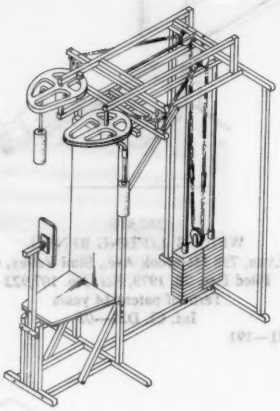
262,810
WEIGHT LIFTING BENCH
Robert G. Lynn, 798 Holbrook Ave., Simi Valley, Calif. 93065
Filed Dec. 28, 1979, Ser. No. 107,922
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



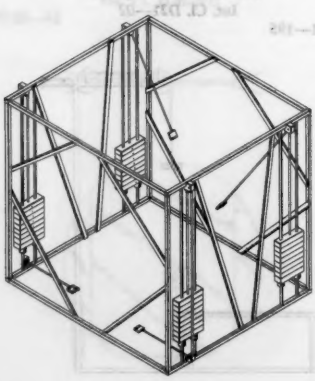
262,811
PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,156
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



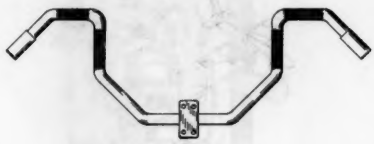
262,812
PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,157
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



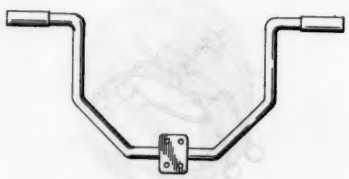
262,813
CABLE CROSSOVER EXERCISE MACHINE
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,178
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



262,814
EXERCISE BAR FOR PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,153
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—198

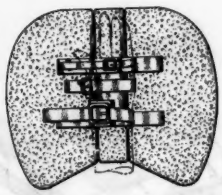


262,815
EXERCISE BAR FOR PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,158
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—198



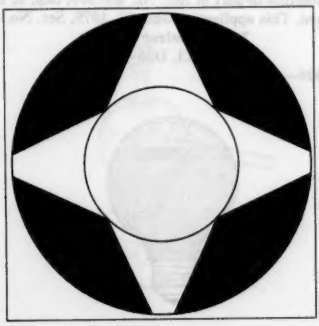
262,816
WATER SKIING HOOK FOR AMPUTEES
Robert Radocy, 2860 Pennsylvania Ave., Boulder, Colo. 80303
Filed Nov. 1, 1979, Ser. No. 90,354
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

262,817
MANUAL SWIMMING AID
John D. Griffith, 625 N. Kalsman Ave., Compton, Calif. 90220
Filed Feb. 4, 1980, Ser. No. 118,414
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—238



262,818
OUTDOOR RECREATIONAL DEVICE
Michael L. Works, 7814 North Blvd., Tampa, Fla. 33604
Filed Sep. 25, 1978, Ser. No. 945,531
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—243

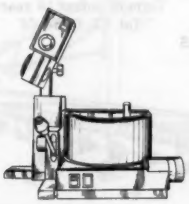
262,819
GUN TARGET
Charles R. Dulude, 33 Burnside Ave., East Hartford, Conn. 06108
Continuation-in-part of Ser. No. 177,530, Aug. 12, 1980, abandoned, which is a division of Ser. No. 894,641, Apr. 7, 1978.
This application Sep. 17, 1980, Ser. No. 188,005
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—15



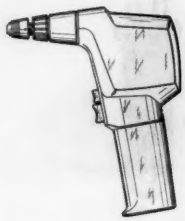
262,820
HEAT EXCHANGER
Thomas R. Carruthers, Glasgow, Scotland, assignor to Fleming Fabrications Ltd., Glasgow, Scotland
Filed Jun. 11, 1979, Ser. No. 47,259
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

262,821
AIR FRESHENER DISPENSER
Albert C. G. Poore, 11, Woodside Rd., New Malden, Surrey, England
Filed Apr. 1, 1980, Ser. No. 136,393
Claims priority, application United Kingdom, Oct. 13, 1979, 991,966
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

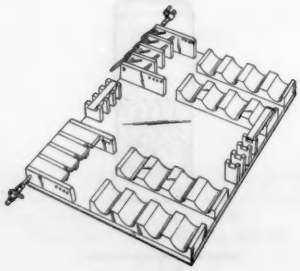
262,822
ROTARY EVAPORATOR
Jürgen H. R. Schindler, Rüsselsheim, Fed. Rep. of Germany, assignor to Buchi Laboratories-Tehnik AG, Flawil, Switzerland
Filed Jan. 9, 1980, Ser. No. 110,627
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



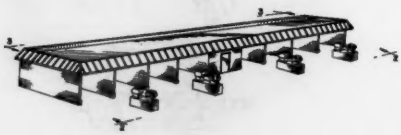
262,823
SURGICAL TOOL
Lawrence E. House, II, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Oct. 17, 1979, Ser. No. 86,028
Term of patent 14 years
Int. Cl. D24—*02;* D8—*05*
U.S. Cl. D24—28



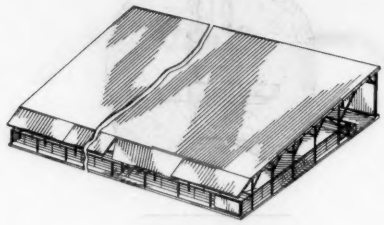
262,824
SURGICAL TRAY FOR OPHTHALMIC INSTRUMENTS
Bernard J. Dignan, 250 Bayview Ave., Belvedere, Calif. 94920
Filed Jan. 16, 1980, Ser. No. 112,677
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—31



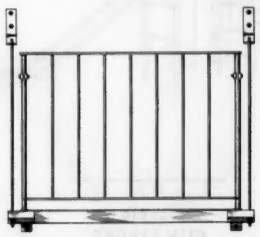
262,825
BUILDING FOR WASHING AUTOMOBILES OR OTHER AUTOMOTIVE VEHICLES
Larry C. Haak, 22929 Burnham Ave., Chicago Heights, Ill. 60411
Filed Dec. 13, 1979, Ser. No. 103,357
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25



262,826
ANIMAL CONFINEMENT BARN
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed Aug. 9, 1979, Ser. No. 65,355
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—30

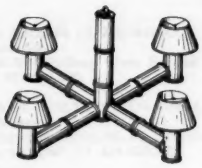


262,827
FIRE ESCAPE PLATFORM
Cheyenne A. Reinhard, 29372 Providence Way, Hayward, Calif. 94544
Filed Nov. 30, 1979, Ser. No. 99,004
Term of patent 14 years
Int. Cl. D6—*99;* D25—*02*
U.S. Cl. D25—62

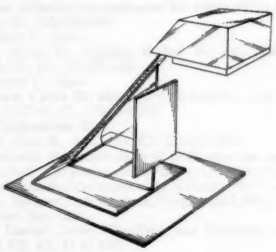


262,828
ELECTRIC LAMP
Norman Baird, Morris Plains, N.J., assignor to Duro Test Corp., N. Bergen, N.J.
Continuation-in-part of Ser. No. 830,909, Sep. 6, 1977, abandoned. This application Jun. 29, 1979, Ser. No. 53,303
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—2

262,829
CHANDELIER
Donald A. Kvasnicka, 718 N. Logan, Colorado Springs, Colo. 80909
Filed Apr. 18, 1979, Ser. No. 31,120
Term of patent 14 years
Int. Cl. D26—*5*
U.S. Cl. D26—84



262,830
TABLE LAMP
John B. Erdell, Apt. 34, 50 Morningside Dr., New York, N.Y. 10025
Filed Apr. 25, 1979, Ser. No. 33,163
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93

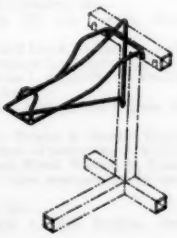


262,831
PIPE
S. Franklin Sher, 609 Lochmor, Danville, Calif. 94526
Filed May 1, 1980, Ser. No. 145,722
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

262,832
COMB
Walter Tihonovich, 1330 Pine, Pueblo, Colo. 81004
Filed Jun. 2, 1980, Ser. No. 155,448
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—30

262,833
BEAUTY BOX
Erling H. Pedersen, Lyngby, Denmark, assignor to Stig Ravn A/S, Farum, Denmark
Filed Mar. 30, 1979, Ser. No. 25,560
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

262,834
SUPPORT RACK FOR A FLAT SADDLE OR THE LIKE
Jeffrey M. Perkins, 20122 Cape Cottage La., Huntington Beach, Calif. 92646
Filed Feb. 4, 1980, Ser. No. 117,854
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—45



262,829
CHANDELIER
Donald A. Xanadu, 778 Old Chapel, Colorado Springs, Colo. 80909
Filed Apr. 12, 1979, Ser. No. 31,129
Term of patent 14 years
Int. Cl.² F21S 3/00
U.S. Cl. 362—84

262,830
TABLE LAMP
John B. Lindell, Apt. 3A, 30 Morningside Dr., New York, N.Y. 10032
Filed Apr. 26, 1979, Ser. No. 33,169
Term of patent 14 years
Int. Cl.² F21S 3/00
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TIPI
S. Franklin Stove, 999 Lindsey Heights, Colo. 81224
Filed Sept. 1, 1981, Serial No. 187,777
Term of patent 14 years
Int. Cl. F24C 3/00
U.S. Cl. ..... 126—1

262,832
COUCH
Walter Tiburonich, 1234 Polo Parkway, Peoria, Ill. 61604
Filed June 2, 1980, Ser. No. 155,555
Term of patent 14 years
Int. Cl. A47C 1/00
U.S. Cl. ..... 297—68

262,833
DRAFTING BOARD
Doris M. Thornton, Lynda Glenn, Rangoon & Big Pine, Burma, Burma
Filed Mar. 26, 1979, Ser. No. 24,169
Term of patent 14 years
Int. Cl. B43L 1/00
U.S. Cl. ..... 33—1

262,834
SUPPORT RACK FOR A FLAT SADDLE OR TREE LIKE
Jeffrey M. Perkins, 28122 Opp Cottage Ln., Huntington Beach, Calif. 92646
Filed Feb. 6, 1980, Ser. No. 117,654
Term of patent 14 years
Int. Cl. B68C 1/00
U.S. Cl. ..... 297—68

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Bartolini, Robert A.; Burke, William J.; and Bloom, Allen, to RCA Corporation. Method of recording an ablative optical recording medium. 4,313,188, Cl. 369-109.000.

Bartz, Wilfried, to Chemische Werke Huels, AG. Heat-curable aqueous coating compositions for anodic dip-electrocoating. 4,312,730, Cl. 204-181.00R.

BASF Aktiengesellschaft: *See*—
Kovacs, Jenoe, 4,312,798, Cl. 260-29.2TN.

BASF Wyandotte Corporation: *See*—
Gallagher, James A.; and Brizgys, Bernardas, 4,312,971, Cl. 528-56.000.
Nassry, Assadullah; Maxwell, Jerrold F.; Compton, John W.; Panek, Edward J.; and Davis, Pauls, 4,312,768, Cl. 252-32.70E.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,312,966, Cl. 525-425.000.
Panek, Edward J.; and Davis, Pauls, 4,312,775, Cl. 252-316.000.

Basiulis, Algerd, to Hughes Aircraft Company. Osmotically pumped environmental control device. 4,312,402, Cl. 165-104.220.

Bata Schuh AG: *See*—
Mayer, Hubert; and Praudisch, Ernst, 4,312,141, Cl. 36-117.000.

Batesville Casket Company, Inc.: *See*—
Baker, Juanita; and Miller, Keith E., 4,312,104, Cl. 27-19.000.

Battelle Development Corporation: *See*—
Anson, Donald, 4,312,301, Cl. 122-4.00D.
Reif, Robert B.; and Albrechtson, Loren R., 4,312,180, Cl. 60-39.09R.

Battery Development Corporation: *See*—
Park, Robert H., 4,313,080, Cl. 320-61.000.

Bauduin, Serge: *See*—
Sabater, Jacques; and Bauduin, Serge, 4,312,592, Cl. 356-28.000.

Bauer, Jack N.: *See*—
DiGiulio, Adolph V.; and Bauer, Jack N., 4,312,958, Cl. 521-88.000.

Baum, Robert A. Method and apparatus for separating oil and water and measuring the amount of oil. 4,313,086, Cl. 324-65.00R.

Baumans, Hans W.; Tuck, Julian S. W.; Ahmad, Mohammad; Le Dinh, Chon T.; and Pinheiro, Victor, to Centre de Recherche Industrielle du Quebec. Apparatus and method for measuring the roughness of lumber. 4,313,172, Cl. 364-563.000.

Baun, Kenneth W.; and Millers, Donald A., II, to Burroughs Corporation. I/O Subsystem using data link processors. 4,313,162, Cl. 364-200.000.

Baus, Andre E. J., to Goodyear Tire & Rubber Company, The. Double contour block tread pattern. 4,312,395, Cl. 152-209.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Zissimopoulos, Nick; and Baron, John, 4,312,341, Cl. 128-214.00E.

Bayer Aktiengesellschaft: *See*—
Beck, Gunther, 4,312,987, Cl. 544-346.000.
Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,312,880, Cl. 424-273.00R.
Junge, Bodo; Muller, Lutz; Sitt, Rudiger; Thomas, Gunter; Krause, Hans P.; and Puls, Walter, 4,312,872, Cl. 424-267.000.
Lehr, Gunter; Lohr, Karl-Dieter; Hucks, Uwe; and Vernaleken, Hugo, 4,312,642, Cl. 55-50.000.
Petersen, Uwe; Metzger, Karl G.; Zeiler, Hans-Joachim; Stadler, Peter; and Voss, Eckart, 4,312,859, Cl. 424-180.000.
Schmidt, Robert R.; and Faust, Wilfried, 4,312,664, Cl. 71-92.000.

Bayer, Oswald; Heinz, Werner; and Rudloff, Georg, to FAG Kugelfischer Georg Schafer & Co. Journal bearing for high-speed tubular shaft. 4,312,546, Cl. 308-187.000.

BBC Brown, Boveri & Company, Limited: *See*—
Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,312,736, Cl. 204-255.000.
Zaugg, Paul, 4,312,179, Cl. 60-39.020.

Beacon, Robert G., to Ellcon-National, Inc. Truck mounted brake apparatus. 4,312,428, Cl. 188-52.000.

Beard, Colin C., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 4,312,873, Cl. 424-263.000.

Beatrice Foods Co.: *See*—
Corey, Donald W., 4,312,431, Cl. 190-45.000.

Beaudoin, Paul; Gilbert, Patrick; and Petres, Jacques, to Commissariat a l'Energie Atomique. Device for vibrating the pin of a viscometer. 4,312,216, Cl. 73-54.000.

Beck, Gunther, to Bayer Aktiengesellschaft. Dimeric ketene of 1,2,4-triazole-3-carboxylic acid. 4,312,987, Cl. 544-346.000.

Becker, Harold L.; Buriks, Rudolf S.; and Dolan, James G., to Petrolite Corporation. Exotherm control in polymerization. 4,312,969, Cl. 526-206.000.

Becker-Prunte GmbH: *See*—
Niemoller, Gerhard; Stromberg, Wilfried; and Schneider, Friedhelm, 4,312,443, Cl. 198-731.000.

Becker, Reinhold; and Michel, Wolfgang, to Hoechst Aktiengesellschaft. Article of manufacture comprising a hollow rod of longitudinally gathered tubing with a surrounding support sheath. 4,312,384, Cl. 138-109.000.

Becton, Dickinson and Company: *See*—
Kaufman, Joseph, 4,312,362, Cl. 128-763.000.

Beecham Group Limited: *See*—
Fosker, George R.; and Burton, George, 4,312,982, Cl. 542-418.000.
Rogers, Norman H.; and O'Hanlon, Peter J., 4,312,867, Cl. 424-248.500.
Rogers, Norman H.; and Coulton, Steven, 4,312,874, Cl. 424-263.000.
Wootton, Gordon, 4,312,881, Cl. 424-273.00R.

Beffa, Fabio: *See*—
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Behringwerke Aktiengesellschaft: *See*—
Ackermann, Othmar; and Stegmann, Helmut, 4,312,947, Cl. 435-237.000.
Blobel, Hans-Georg; Schaeg, Werner; and Bruckler, Jorg, 4,312,942, Cl. 435-7.000.

Belisomi, Pietro: *See*—
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Bell, Cecil R., Jr.: *See*—
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Bell & Howell Company: *See*—
Kavenik, Frank E., 4,313,208, Cl. 455-42.000.
Wells, Thomas R.; and Overman, John W., 4,312,578, Cl. 353-79.000.

Bell, Steven L. Intank fuel filter. 4,312,753, Cl. 210-250.000.

Bell Telephone Laboratories, Incorporated: *See*—
Candy, James C.; and Wooley, Bruce A., 4,313,173, Cl. 364-723.000.
Carbrey, Robert L.; and Dalley, James E., 4,313,225, Cl. 455-602.000.
Degenkolb, Eugene O.; Griffiths, James E.; and Mogab, Cyril J., 4,312,732, Cl. 204-192.00E.
Fickenscher, Hermann; Hock, Richard H.; Ray, Richard C.; and Scuderi, Rudolph, 4,313,060, Cl. 307-23.000.
Fleischer, Paul E., 4,313,096, Cl. 333-173.000.
Hartman, Robert L.; Koszi, Louis A.; and Schumaker, Norman E., 4,313,125, Cl. 357-17.000.
Jordan, David S.; and Weber, Roy P., 4,313,035, Cl. 179-18.0BE.
Leland, Kenneth W., 4,313,211, Cl. 455-139.000.
Maxemchuk, Nicholas F., 4,313,197, Cl. 370-111.000.

Bellows, Richard J.: *See*—
Grimes, Patrick G.; Zahn, Markus; and Bellows, Richard J., 4,312,735, Cl. 204-228.000.

Bemis Company, Inc.: *See*—
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Bendix Autolite Corporation: *See*—
Comer, Richard L., 4,312,120, Cl. 29-611.000.

Bendix Corporation, The: *See*—
Scriffignana, Peter J.; and Hadeler, Theodore T., 4,312,131, Cl. 33-350.000.
Waghorn, Robert D., 4,312,125, Cl. 29-884.000.

Bengt Petersson New Products Investment AB: *See*—
Petersson, Bengt O., 4,312,077, Cl. 2-265.000.

Benkwitt, Frances C.: *See*—
Monty, Henri; Querido, Robert; and Benkwitt, Frances C., 4,312,843, Cl. 423-267.000.

Beran, James J.: *See*—
Doles, Glenn P.; and Beran, James J., 4,313,132, Cl. 358-114.000.

Berardinelli, Frank M.: *See*—
Jones, Rufus S.; and Berardinelli, Frank M., 4,312,977, Cl. 528-241.000.

Berg, Ake; and Gundersen, Marius, to Vefi A/S. Arrangement for dispensing propagation pots, etc. 4,312,170, Cl. 53-247.000.

Berg, Morris: *See*—
Yu, Ruey J.; and Berg, Morris, 4,312,770, Cl. 252-514.000.

Berger, Dieter: *See*—
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,312,834, Cl. 422-56.000.

Berger, Gunther: *See*—
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Berstein, Patricio: *See*—
Stephens, Walter R.; and Berstein, Patricio, 4,313,168, Cl. 364-465.000.

Bersteir, Patrick, to Imperial Oil Limited. Wireless link between vehicles and a stationary installation. 4,313,228, Cl. 455-617.000.
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, to Montedison, S.p.A. Self-extinguishing polymer compositions. 4,312,805, Cl. 260-45.9NP.
Bertolotti, Francis: *See*—
Daverio, Jean-Claude; Bertolotti, Francis; and Weber, Georges, 4,312,094, Cl. 15-302.000.
Berton, Yves; and Chauvet, Pierre, to Commissariat a l'Energie Atomique. Effluent treatment process. 4,312,758, Cl. 210-709.000.
Bertotti, Elvio: *See*—
Ligutti, Marzio; and Bertotti, Elvio, 4,312,978, Cl. 528-300.000.
Besser Company: *See*—
Wallis, William F., 4,312,242, Cl. 74-87.000.
Best Lock Corporation: *See*—
Roos, William G., 4,312,201, Cl. 70-422.000.
Beuscher, Donald A. Frequency standard. 4,313,217, Cl. 455-226.000.
Beyer, Gunter: *See*—
Cotte, Dietrich; Scheffler, Holger; Beyer, Gunter; Bugge, Dietmar; and Kuhn, Manfred, 4,312,194, Cl. 66-75.200.
BHF Engineering Limited: *See*—
Pack, Ernest A., 4,312,655, Cl. 65-28.000.
Biagini, Guido, to Sundstrand Corporation. Environmental control system for aircraft with improved efficiency. 4,312,191, Cl. 62-402.000.
Bianco, David P., to Nagem, George. Modular furniture. 4,312,086, Cl. 5-2.00R.
Biasini, Americole R. Music stand extender. 4,312,490, Cl. 248-542.000.
Bidwell, Robert E.: *See*—
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Bilek, Karl: *See*—
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, 4,312,139, Cl. 34-54.000.
Bilsky, Herbert W.; and Callen, Patrick J., to RCA Corporation. Battery charging system. 4,313,078, Cl. 320-15.000.
Bingham, Harold L. Trailer mounted, portable coal washing and separating apparatus. 4,312,749, Cl. 209-44.000.
Binns, Lloyd S. Blind rivet assembly. 4,312,613, Cl. 411-34.000.
Biotteau, Gerard. Sewing machine adapted to stitch on a curved path. 4,312,286, Cl. 112-308.000.
Birkenmaier, Wilhelm: *See*—
Negele, Richard; and Birkenmaier, Wilhelm, 4,312,547, Cl. 308-187.100.
Bishnoi, Indra K.: *See*—
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Black & Decker Inc.: *See*—
Pioch, Peter P., 4,312,421, Cl. 181-202.000.
Black, Millard G.: *See*—
Cory, Stanley A.; Black, Millard G.; and Scholtz, Gilbert J., 4,312,276, Cl. 104-38.000.
Blackburn, Curtis D.; Blackburn, Randall L.; and Adkins, Dewey L. Method and apparatus for removing sediment or other flowable solid material from a bed underlying a body of water. 4,312,762, Cl. 210-768.000.
Blackburn, Randall L.: *See*—
Blackburn, Curtis D.; Blackburn, Randall L.; and Adkins, Dewey L., 4,312,762, Cl. 210-768.000.
Blackington, Paul A., to Sheltered Workshop for the Disabled, Inc. Fiber optic control apparatus. 4,313,226, Cl. 455-603.000.
Blahak, Johannes; and Menk, Hermann, to Metzeler Kautschuk GmbH. Release agent for removing plastics, especially polyurethane plastics from molds. 4,312,672, Cl. 106-38.220.
Blair, Gerald E.; Merry, J. Bradford; and Wylot, James M., to Eastman Kodak Company. Acousto-optic device and method using tellurite glass composition. 4,312,660, Cl. 65-85.000.
Blanchard, James B.: *See*—
Adams, Harold P.; Taylor, Wesley L.; and Blanchard, James B., 4,312,226, Cl. 73-336.000.
Blaupunkt Werke GmbH: *See*—
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Blaurock, Gunter; Albert, Ernst; Reichert, Klaus; and Schlereth, Rudolf, to Deutsche Star Kugelhalter GmbH. Torque transmitting bearing assembly. 4,312,545, Cl. 308-6.00C.
Blobel, Hans-Georg; Schaeg, Werner; and Bruckler, Jorg, to Behringwerke Aktiengesellschaft. Process for the extraction of microorganisms and diagnostic agents containing them. 4,312,942, Cl. 435-7.000.
Bloch, Claude: *See*—
Dupressoir, Albert; and Bloch, Claude, 4,313,122, Cl. 343-818.000.
Block, Jacob, to W. R. Grace & Co. Viscosifying agent. 4,312,765, Cl. 252-8.50C.
Bloom, Allen: *See*—
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Bloore, Frederick W.; and Seaman, Peter H., to Hotfoil Limited. Electrically impedant articles. 4,313,101, Cl. 338-212.000.
Blutspendedienst det Landesverbande des Deutschen Roten Kreuzes Niedersachsen, Oldenburg und Bremen GmbH: *See*—
Ahrens, Ulrich E., 4,312,949, Cl. 435-272.000.
Bock, Donald D.; and Hedel, Kurt K., to General Electric Company. High input voltage DC to DC power converter. 4,313,155, Cl. 363-21.000.
Bock, Gernot: *See*—
Theurer, Josef; Bock, Gernot; and Ganguly, Mihir, 4,312,275, Cl. 104-12.000.
Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
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Bodner, Richard. Board game apparatus. 4,312,510, Cl. 273-256.000.
Boehringer Ingelheim International GmbH: *See*—
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Boehringer Mannheim GmbH: *See*—
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Boeing Company, The: *See*—
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McKinney, Maurice E., 4,312,486, Cl. 244-215.000.
Van Blunk, Joseph J., 4,312,398, Cl. 164-108.000.
Boettcher, William C., to D.O.V.E. Equipment Corporation. Helical vending machine. 4,312,460, Cl. 221-75.000.
Boffito, Claudio; Barosi, Aldo; and Figini, Alessandro, to SAES Getters S.p.A. Non-evaporable ternary gettering alloy and method of use for the sorption of water, water vapor and other gases. 4,312,669, Cl. 75-177.000.
Bokelmann, Horst, to Metzeler Schaum GmbH. Method and apparatus for the manufacture of a ball of foam material with embossed surface. 4,312,827, Cl. 264-321.000.
Boksay, Istvan; Soder, Alfons; Bollmann, Volkher; and Weber, Rolf-Ortwin, to Hoechst Aktiengesellschaft. Pharmaceutical compositions containing N-alkyl-N-(nuclearly-substituted) benzylamines having vasotonia-regulating activity. 4,312,861, Cl. 424-220.000.
Bollinger, William A.; and Hipp, Wilbur B., to Sunbeam Corporation. Mower with grasscatcher. 4,312,176, Cl. 56-202.000.
Bollmann, Volkher: *See*—
Boksay, Istvan; Soder, Alfons; Bollmann, Volkher; and Weber, Rolf-Ortwin, 4,312,861, Cl. 424-220.000.
Bonnet, Alain, to Saint Gobain Industries. Continuous production of building elements having cellular cores. 4,312,822, Cl. 264-70.000.
Boose, James R.: *See*—
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Bopp, Warren G., to Eaton Corporation. Viscous fluid clutch and standpipe arrangement therefor. 4,312,433, Cl. 192-58.00B.
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Borgersen, Roland; and Mullen, James G., to King Tester Corporation. Portable hardness tester. 4,312,220, Cl. 73-81.000.
Bosch, Dieter G., to Bunker Ramo Corporation. Electrical penetration apparatus and method of making same. 4,313,030, Cl. 174-151.000.
Bossert, Emily C.: *See*—
Treadwell, Kenneth; and Bossert, Emily C., 4,312,959, Cl. 521-107.000.
Bostan, Nicolae. Aircraft with circular wing. 4,312,483, Cl. 244-12.200.
Bostwick, Robert, to Union Carbide Corporation. Compositions of polyethylene and a copolymer of ethylene-alkyl acrylate and the use thereof as jacketing about telephone wires and cables. 4,312,918, Cl. 428-379.000.
Bouillet, Edmond: *See*—
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Bouldin, Eric W.: *See*—
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Bourgeois, Claude: *See*—
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Bourlet, Maurice V., to Fabrique Nationale Herstal, en abrege F.N. Pistol. 4,312,263, Cl. 89-154.000.
Bouyoucos, John V.: *See*—
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Bowyer, William H.: *See*—
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Boyd, Kenneth J., to Weber-Knapp Company. Counterbalance support. 4,312,097, Cl. 16-279.000.
Braaten, Terry L.: *See*—
Taylor, Harry M.; Braaten, Terry L.; Stephens, Jack E.; and Geraci, Donald C., 4,312,424, Cl. 184-6.400.
Brakebill, Harold G., to Robertshaw Controls Company. Valve positioner and method of making the same. 4,312,319, Cl. 123-568.000.
Brammall, Inc.: *See*—
Gillette, Robert H., 4,312,529, Cl. 292-315.000.
Brandes, Wilhelm: *See*—
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Brannan, Robert C.; Markham, Harvey R.; and Nilsson, Ben A., to International Business Machines Corporation. Charge density control for an electrostatic copier. 4,312,589, Cl. 355-14.0CH.
Braun, Hans-Peter: *See*—
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,312,834, Cl. 422-56.000.
Braun, Keith A.; and Johannsen, John F., to David Manufacturing Co. Grain cleaning apparatus. 4,312,750, Cl. 209-291.000.
Braunschweiger Flammenfilter Leinemann & Co.: *See*—
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Breit, Hans P.: *See—*
Schwomma, Otto; Raimann, Gerhard; and Breit, Hans P., 4,312,580, Cl. 354-64.000.
Brennan, William F. Bicep exercising curling bar. 4,312,506, Cl. 272-123.000.
Bricker, John K.; and Mandula, Joseph M., Jr., to Republic Steel Corporation. Method and apparatus for pipe inspection. 4,312,230, Cl. 73-638.000.
British Hovercraft Corporation: *See—*
Wheeler, Raymond L., 4,312,690, Cl. 156-253.000.
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Broadhead, James H.: *See—*
Kennedy, Joe H.; and Broadhead, James H., 4,312,538, Cl. 297-408.000.
Brodis, Eric P.; and Ricca, Anthony. Method and apparatus for making simulated stained-glass. 4,312,688, Cl. 156-63.000.
Broeksema, Egbert: *See—*
Kraakman, Hillebrand J. J.; Broeksema, Egbert; and Nijboer, Sjoerd, 4,312,823, Cl. 264-107.000.
Broetto, Costantino, to Fratelli Borletti S.p.A. Level sensing device for dielectric liquids. 4,313,102, Cl. 340-59.000.
Broughton, Donald B., to UOP Inc. Separation process. 4,313,015, Cl. 585-828.000.
Brown, Arthur; and Murray, Kevin F., to Norcros Investments Limited. Fluid cooled quenching cars. 4,312,711, Cl. 202-227.000.
Brown Boggs Foundry and Machine Company Limited, The: *See—*
Hollo, Leslie J., 4,312,435, Cl. 192-149.000.
Brown, Charles M.: *See—*
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., 4,312,894, Cl. 427-34.000.
Brown, Harold, to General Electric Company. Thrust control system for a gas turbine engine. 4,313,167, Cl. 364-431.020.
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., to Union Carbide Corporation. Hard facing of metal substrates. 4,312,894, Cl. 427-34.000.
Brown, Ivan R., to Hardinge Brothers, Inc. Programmable turret-type machine tool. 4,312,105, Cl. 29-39.000.
Browning, Robert K. Inflatable bathtub for bedridden patients. 4,312,084, Cl. 4-538.000.
Bruckler, Jorg: *See—*
Blobel, Hans-Georg; Schaeg, Werner; and Bruckler, Jorg, 4,312,942, Cl. 435-7.000.
Brugger, Karl, to Lingl Corporation. Brick setting apparatus. 4,312,440, Cl. 198-458.000.
Brumfield, Robert C. Methods and means for circulating a dialysate. 4,312,757, Cl. 210-646.000.
Brummett, Marshall G., to Owens-Illinois, Inc. Brush assembly holding sleeves positioned on a container. 4,312,697, Cl. 156-423.000.
Brunbeck, Richard T.: *See—*
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Brunswick Corporation: *See—*
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Bryant, Emerson C., to National-Standard Company. Tire building apparatus. 4,312,696, Cl. 156-415.000.
Bryant Grinder Corporation: *See—*
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Bryce D. Jewett Machine Manufacturing Company, Inc.: *See—*
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Buchel, Karl H.: *See—*
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Budraitis, Tadas, to Productronix, Inc. Load cell. 4,312,241, Cl. 73-862.350.
Buettner-Schilde-Haas AG: *See—*
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Bugge, Dietmar: *See—*
Cotte, Dietrich; Scheffler, Holger; Beyer, Gunter; Bugge, Dietmar; and Kuhn, Manfred, 4,312,194, Cl. 66-75.200.
Bundrick, Benjamin, Jr. Flexible cylinder-head internal combustion engine. 4,312,306, Cl. 123-51.0BA.
Bunish, Stephen, to Anaconda Company, The. Shielded mining cable. 4,313,029, Cl. 174-115.000.
Bunker Ramo Corporation: *See—*
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Buriks, Rudolf S.: *See—*
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Burke, William J.: *See—*
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Burkitt, David T., to Allied Corporation. Producing anthracene from creosote. 4,313,012, Cl. 585-816.000.
Burman, Keith, to York Truck Equipment Limited. Semi-trailers. 4,312,520, Cl. 280-765.000.
Burmeister & Wain A/S: *See—*
Kollerup, Vagn, 4,312,302, Cl. 122-4.00D.
Burns, Carmen D., to National Semiconductor Corporation. Tear strip planarization ring for gang bonded semiconductor device interconnect tape. 4,312,926, Cl. 428-571.000.
Burroughs Corporation: *See—*
Baun, Kenneth W.; and Millers, Donald A., II, 4,313,162, Cl. 364-200.000.
Woodward, Thomas R., 4,313,206, Cl. 375-110.000.
Burt, Arthur D., to McPherson's Limited. Sheet material cutting device. 4,312,610, Cl. 408-26.000.
Burton, George: *See—*
Fosker, George R.; and Burton, George, 4,312,982, Cl. 542-418.000.
Busacca, Guido; Meli, Vincenzo; Passaglia, Arcangelo; and Sanfilippo, Michele, to Societa Italiana Telecomunicazioni Siemens S.p.A. Crankshaft tuning mechanisms for microwave oscillators. 4,313,091, Cl. 331-90.000.
Butter, Stephen A.; and Chester, Arthur W., to Mobil Oil Corporation. Aromatics processing catalysts. 4,312,790, Cl. 252-455.00Z.
C.G.R. MeV: *See—*
Convert, Guy; Diamand, Felix; Dufour, Jacques; and Le Bourgeois, Jean-Paul, 4,312,364, Cl. 128-804.000.
C. R. Bard, Inc.: *See—*
Meisch, Charles E.; and Baker, Robert N., 4,312,352, Cl. 128-294.000.
C. W. Zumbiel Company, The: *See—*
Summers, Gus E., 4,312,446, Cl. 206-185.000.
Cabot Corporation: *See—*
Herchenroeder, Robert B. H., 4,312,682, Cl. 148-2.000.
Caci, Inc. - Federal: *See—*
Smith, David W., 4,313,081, Cl. 323-209.000.
Caldwell, Donald L.: *See—*
McIntyre, John M.; and Caldwell, Donald L., 4,312,723, Cl. 204-98.000.
Calhoun, Gregory L., to Westinghouse Electric Corp. Multiple tube pulling apparatus. 4,312,124, Cl. 29-726.000.
Callahan, Allie. Lawn edging machine. 4,312,178, Cl. 56-256.000.
Callahan, James J.: *See—*
Snow, John P.; and Callahan, James J., 4,312,425, Cl. 184-7.00D.
Callen, Patrick J.: *See—*
Bilsky, Herbert W.; and Callen, Patrick J., 4,313,078, Cl. 320-15.000.
Calocerinos & Spina: *See—*
McHerron, James I., 4,313,063, Cl. 307-135.000.
Calviello, Joseph A., to Eaton Corporation. Method of making field-effect transistors with micron and submicron gate lengths. 4,312,112, Cl. 29-571.000.
Calviello, Joseph A., to Eaton Corporation. Method of making field-effect transistors with micron and submicron gate lengths. 4,312,113, Cl. 29-571.000.
Calvin, Noel M. Microwave proximity sensor. 4,313,118, Cl. 343-701.000.
Cambridge Thermionic Corporation: *See—*
Yamamura, Akira, 4,312,628, Cl. 417-424.000.
Camp, Donald L., to Shaped Charge Specialist, Inc. Shaped charge mounting system. 4,312,273, Cl. 102-310.000.
Campbell, Donn V.; DeSantis, Charles M.; and Wills, John R., to United States of America, Army. Compact monopole antenna with structured top load. 4,313,121, Cl. 343-790.000.
Campbell, Joseph O.; and Jean-Pierre, Marie Y., to Monsanto Company. Adhesion in metal plating. 4,312,962, Cl. 525-5.000.
Campbell, Robert, to Hydro-Thermal Corporation. Method for defibrating waste paper and dispersing contaminants. 4,312,701, Cl. 162-4.000.
Canadiana Garden Products Inc.: *See—*
Vanderhoef, John, 4,312,174, Cl. 56-320.200.
Candy, James C.; and Wooley, Bruce A., to Bell Telephone Laboratories, Incorporated. Linear interpolator. 4,313,173, Cl. 364-723.000.
Canfield, Sheldon A.; and Sanik, Paul S., to Owens-Corning Fiberglas Corporation. Method of and apparatus for sensing the level of molten glass in a glass melting furnace. 4,312,657, Cl. 65-29.000.
Cann, Roald: *See—*
Reda, Kazimierz; Cann, Roald; and Ambrose, Lawrence A., 4,312,155, Cl. 51-105.00R.
Canon Denshi Kabushiki Kaisha: *See—*
Ohniwa, Takehiko; and Sugiura, Yoji, 4,312,583, Cl. 354-234.000.
Canon Kabushiki Kaisha: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.
Hara, Toshitami, 4,313,124, Cl. 346-140.00R.
Minoura, Kazuo; and Hirayama, Kazuhiro 4,312,588, Cl. 355-8.000.
Ohniwa, Takehiko; and Sugiura, Yoji, 4,312,583, Cl. 354-234.000.
Capostagno, Joseph A.; Chan, Kingsley; and Kartavenko, Alexandre, to Lightolier Incorporated. Lighting fixture with uniform mounting frame for new installations. 4,313,154, Cl. 362-365.000.
Carbol, Vlastimil, to Oy Partek AB. Fibre glass composition. 4,312,952, Cl. 501-36.000.
Carbrey, Robert L.; and Dalley, James E., to Bell Telephone Laboratories, Incorporated. Opto-isolator hybrid circuit. 4,313,225, Cl. 455-602.000.
Cardus, Francis. Apparatus for applying a pasty or like product by means of a rotary coating pad. 4,312,091, Cl. 15-97.00A.
Carey, Thomas A.; and Kesl, Elmer M., to International Harvester Company. Cutterhead crop redirectors. 4,312,481, Cl. 241-101.700.

Carico, Robert D.: *See*—
Pickens, Patrick A.; Lindroth, Thomas A.; and Carico, Robert D., 4,312,675, Cl. 106-171.000.

Carini, George F., to Clay Harden Company, The. Continuous casting method and mold flux powders. 4,312,400, Cl. 164-472.000.

Carlassare, Francesco: *See*—
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.

Carles, Henri: *See*—
Conte, Jean-Francois; and Carles, Henri, 4,312,512, Cl. 277-235.00B.

Carlisle, Charles T., to Geochem Research, Inc. Method and apparatus for fluid analysis. 4,312,635, Cl. 23-230.00R.

Carraher, Charles E., Jr.; Giron, David J.; Schroeder, Jack A.; and McNeely, Christy A., to Wright State University. Modified cellulosic products having enhanced thermal, solvent, and biological properties. 4,312,981, Cl. 536-84.000.

Carrier Corporation: *See*—
Jacobs, John J.; and Kuhn, Gerhard, 4,312,627, Cl. 417-363.000.
Martini, Richard M., 4,313,054, Cl. 235-78.00R.
Tulowiecki, David, 4,312,474, Cl. 236-49.000.

Carrion, Jean-Pierre; and Le Buhan, Christian, to Regie Nationale des Usines Renault. Device for preventing or effecting the unlocking of the trunk lid of an automobile vehicle. 4,312,197, Cl. 70-135.000.

Caruso, Innocenzo; Montrone, Franco; and Molteni, Luigi, to Dr. L. Zambeletti S.p.A. Use of rifamycin SV and its related salts in the treatment of rheumatoid arthritis, and related formulations suited for the purpose. 4,312,866, Cl. 424-244.000.

Carver, Thomas R.; and Armistead, Fontaine C., to Texaco Development Corporation. Focus improver and solar energy collector. 4,312,329, Cl. 126-439.000.

Casamitjana, Jordi. Centrifugal water separator. 4,312,751, Cl. 210-94.000.

Casio Computer Co., Ltd.: *See*—
Yoshida, Junichi, 4,313,108, Cl. 340-365.0VL.

Cassel, Thomas R. Pipe coupling with open sleeve. 4,312,526, Cl. 285-419.000.

Caterpillar Tractor Co.: *See*—
Freese, Gary P.; and Trayler, Robert J., 4,312,411, Cl. 172-823.000.
Lukavich, Paul J., 4,312,145, Cl. 37-124.000.
Stedman, Robert N., 4,312,427, Cl. 187-9.00E.

Caule, Elmer J., to Olin Corporation. Lubricated cupreous sheet comprising an organophosphonate layer and process therefor. 4,312,922, Cl. 428-446.000.

Cavazzana, Andrea: *See*—
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, 4,312,336, Cl. 128-92.00A.

Cazaly, Laurence G.; and Lamon, Douglas. Method of constructing a storage tank. 4,312,167, Cl. 52-745.000.

Cecil, Lon V., to Lockwood Association, Inc., The. Data controlled switch for telephone inputs to a computer. 4,313,176, Cl. 364-900.000.

Cefarelli, Frank P.; and Evans, Robert T., to International Business Machines Corp. Multi-fiber optic connector. 4,312,564, Cl. 350-96.220.

Celanese Corporation: *See*—
Choe, Eui W., 4,312,976, Cl. 528-179.000.
Jones, Rufus S.; and Berardinelli, Frank M., 4,312,977, Cl. 528-241.000.

Central Glass Company, Limited: *See*—
Masuda, Hiroshi; Sakai, Hirohiko; and Saito, Syoji, 4,312,656, Cl. 65-29.000.
Watanabe, Nobuatsu; Aramaki, Minoru; and Kita, Yasushi, 4,312,718, Cl. 204-60.000.

Centre de Recherche Industrielle du Quebec: *See*—
Baumans, Hans W.; Tuck, Julian S. W.; Ahmad, Mohammad; Le Dinh, Chon T.; and Pinheiro, Victor, 4,313,172, Cl. 364-563.000.

Centre Electronique Horloger S.A.: *See*—
Hermann, Jean; and Bourgeois, Claude, 4,313,071, Cl. 310-361.000.

Chan, Kingsley: *See*—
Capostagno, Joseph A.; Chan, Kingsley; and Kartavenko, Alexandre, 4,313,154, Cl. 362-365.000.

Chandalia, Kiran B.; and Barnowski, Henry G., to Olin Corporation. Stabilization of high resilience polyurethane foam. 4,312,963, Cl. 525-56.000.

Chang, Wei: *See*—
Gold, Elijah H.; and Chang, Wei, 4,312,863, Cl. 424-230.000.

Chapman, Rick J.: *See*—
Hertel, Roger D.; and Chapman, Rick J., 4,312,157, Cl. 52-13.000.

Charneski, Mitchell D.; Kelley, James K.; and Gazdecki, Frank J. Electrical joint compound. 4,312,793, Cl. 252-513.000.

Chase, Richard P.: *See*—
Fournier, Roger H.; Chase, Richard P.; and Englander, Gary E., 4,312,154, Cl. 51-101.00R.

Chattem, Inc.: *See*—
Pratt, Charles E., 4,312,769, Cl. 252-35.000.

Chauvet, Pierre: *See*—
Berton, Yves; and Chauvet, Pierre, 4,312,758, Cl. 210-709.000.

Chemische Fabrik: *See*—
Kuster, Erich; Goossens, Bernhard; Dahmen, Kurt; and Barthell, Eduard, 4,312,998, Cl. 564-205.000.

Chemische Werke Huels, AG: *See*—
Bartz, Wilfried, 4,312,730, Cl. 204-181.00R.

Cheng, Dah Y., to International Power Technology, Inc. Removal of sulfur compounds from combustion product exhaust. 4,312,643, Cl. 55-73.000.

Chester, Arthur W.: *See*—
Butter, Stephen A.; and Chester, Arthur W., 4,312,790, Cl. 252-455.00Z.

Chevron Research Company: *See*—
Adams, John H.; and Dexter, Donald D., 4,312,767, Cl. 252-25.000.
Sigworth, Harry W., Jr., 4,312,687, Cl. 156-245.000.

Chiao, Wen B., to National Starch and Chemical Corporation. Curing agents for epoxy resins. 4,312,974, Cl. 528-114.000.

Chiaramonte, Gerald R., to Tosco Corporation. Process for maximizing oil yield in the retorting of oil shale. 4,312,740, Cl. 208-11.00R.

Chisso Corporation: *See*—
Motozato, Yoshiaki; and Ishibashi, Hiroaki, 4,312,980, Cl. 536-76.000.

Chittenden, Richard M., to Abbott Laboratories. I.V. Administration flow rate gauge. 4,312,342, Cl. 128-214.00R.

Chivilo', Fausto; and Sezzi, Francesco, to Snamprogetti, S.p.A. Pollution-preventing and driving device for internal combustion engines. 4,312,310, Cl. 123-198.0DB.

Choe, Eui W., to Celanese Corporation. Single-stage melt polymerization process for the production of high molecular weight polybenzimidazole. 4,312,976, Cl. 528-179.000.

Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., to Rohm and Haas Company. Filtration and deionization prepared from cationic and anionic emulsion ion exchange resins. 4,312,956, Cl. 521-28.000.

Chovan, Joseph L., to General Electric Company. Acoustic vibration sensor and sensing system. 4,313,185, Cl. 367-149.000.

Chraplyvy, Andrew R.; Croat, John J.; and Herbst, Jan F., to General Motors Corporation. Selective magnetization of manganese-aluminum alloys. 4,312,684, Cl. 148-121.000.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6-, 1-And 2-substituted-1-carbadethiapen-2-em-3-carboxylic acids. 4,312,871, Cl. 424-263.000.

Christensen, Gordon D.: *See*—
Donaher, Charles J.; and Christensen, Gordon D., 4,312,555, Cl. 339-75.0MP.

Christiansen, Thorbjorn. Arrangement in an automatic angling machine. 4,312,147, Cl. 43-15.000.

Christopher, Todd J: *See*—
Wilber, James A.; and Christopher, Todd J, 4,313,062, Cl. 307-108.000.

Chronberg, Sten. Method and device for cutting and shaping a sheet or slab of paste based in particular on clays for making ceramic objects. 4,312,825, Cl. 264-153.000.

Chrysler Corporation: *See*—
Kramer, Dennis M.; and Dock, John C., 4,312,214, Cl. 73-35.000.

Chu, Pak-Jong, to Northern Telecom Limited. Latching lever for printed circuit boards. 4,313,150, Cl. 361-399.000.

Ciaramitaro, David A.: *See*—
Baker, James J.; Sittig, Robert C.; and Ciaramitaro, David A., 4,312,272, Cl. 102-275.800.

Ciba-Geigy AG: *See*—
Lienhard, Paul; and Beffa, Fabio, 4,312,808, Cl. 260-198.000.

Ciba-Geigy Corporation: *See*—
Fattinger, Volker; and Schneider, Jug, 4,312,646, Cl. 55-218.000.
Guth, Christian, 4,312,914, Cl. 428-290.000.
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,312,818, Cl. 260-976.000.
Yokoyama, Naokata, 4,312,870, Cl. 424-258.000.

Cincinnati Microwave, Inc.: *See*—
Jaeger, James L.; and Valentine, Michael D., 4,313,216, Cl. 455-226.000.

Citizen Watch Co., Ltd.: *See*—
Waki, Masahiko; and Maekawa, Yasuo, 4,313,187, Cl. 368-319.000.

Claas, Helmut; and Tophinke, Franz, to Claas OHG. Harvester thresher. 4,312,365, Cl. 130-27.00P.

Claas OHG: *See*—
Claas, Helmut; and Tophinke, Franz, 4,312,365, Cl. 130-27.00P.

Clark, Earl A. Heat engine with variable volume displacement means. 4,312,181, Cl. 60-519.000.

Clark, Earl J., to Tandy Brands, Inc. Pistol holster with adjustable safety strap. 4,312,466, Cl. 224-243.000.

Clark Equipment Company: *See*—
Rittman, Udo, 4,312,418, Cl. 180-68.500.

Clarke, William J., to Hayward Baker Company. Method for grouting joints and/or cracks in sewer conduits. 4,312,605, Cl. 405-264.000.

Claude, Mutrux, to Ebauches Electroniques SA. Integrated circuit detecting the characteristic of an external system. 4,313,064, Cl. 307-475.000.

Clay Harden Company, The: *See*—
Carini, George F., 4,312,400, Cl. 164-472.000.

Clelford, Douglas H.; and Fowler, Donald W., to United Technologies Corporation. Force feel actuator with limited proportional/integral error feedback. 4,313,165, Cl. 364-424.000.

Clemens, Ronald: *See*—
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,312,177, Cl. 56-208.000.

Clements, John A., to University of California, Regents of the. Lung surfactant compositions. 4,312,860, Cl. 424-199.000.

Clendenin, William H., to General Electric Company. Apparatus for testing the tack time of epoxy prepreg. 4,312,212, Cl. 73-15.400.

Cleveland Clinic Foundation, The: *See*—
Shainoff, John R., 4,312,727, Cl. 204-180.00G.

Clinch, Marvin R.: *See—*
Nardozza, Vincent J.; and Clinch, Marvin R., 4,313,207, Cl. 455-1.000.
Clough, David; Drain, David J.; and Ruder, Gary C. F., to Smith & Nephew Pharmaceuticals, Ltd. Sterilizing hydrophilic contact lenses. 4,312,833, Cl. 422-30.000.
Cochran, Thomas N. Brake actuating system. 4,312,544, Cl. 303-96.000.
Codex Corporation: *See—*
Kameya, Andrew M., 4,313,202, Cl. 375-15.000.
Codman and Shurtleff, Inc.: *See—*
Nicholson, James E.; and Milesky, Lawrence, 4,312,361, Cl. 128-748.000.
Cohen, Max, to Borden, Inc. Process for shucking a mollusk. 4,312,099, Cl. 17-48.000.
Cohen, Milton J. Filter device for injectable fluid. 4,312,349, Cl. 128-272.000.
Colgate-Palmolive Company: *See—*
Grand, Paul S., 4,312,855, Cl. 424-59.000.
Collington, Kenneth T.: *See—*
Puri, Rishi R.; and Collington, Kenneth T. 4,312,776, Cl. 252-350.000.
Collins, Paul W., to G. D. Searle & Co. α Chain dienic prostanoic acid derivatives. 4,312,994, Cl. 560-121.000.
Colt Industries Operating Corp: *See—*
Peiser, Adolf E.; and Latzko, Richard I., 4,312,111, Cl. 29-568.000.
Colucci, Stephen L., to National-Standard Company. System for stretch casting filamentary shaped bodies. 4,312,670, Cl. 75-200.000.
Colvin, David P. Method for fabrication of physiological models. 4,312,826, Cl. 264-221.000.
Colvin, Johnnie F. Hygienic cabinet. 4,312,345, Cl. 128-229.000.
Comau S.p.A.: *See—*
Favareto, Marcello, 4,312,622, Cl. 414-730.000.
Comer, Richard L., to Bendix Autolite Corporation. Glow plug manufacture. 4,312,120, Cl. 29-611.000.
Commissariat a l'Energie Atomique: *See—*
Auchapt-Tavenaux, Jacqueline; Auchapt, Pierre; Sauvage, Henri; and Tarnero, Maurice, 4,312,836, Cl. 422-198.000.
Beaudoin, Paul; Gilbert, Patrick; and Petres, Jacques, 4,312,216, Cl. 73-54.000.
Berton, Yves; and Chauvet, Pierre, 4,312,758, Cl. 210-709.000.
Communications Satellite Corporation: *See—*
Rhodes, Smith A., 4,313,205, Cl. 375-86.000.
Compton, John W.: *See—*
Nassry, Assadullah; Maxwell, Jerrold F.; Compton, John W.; Panek, Edward J.; and Davis, Pauls, 4,312,768, Cl. 252-32.70E.
Computer Automation, Inc.: *See—*
Kaufman, Phillip A.; Washburn, Jerry R.; and Stapinski, Paul A., 4,313,160, Cl. 364-260.000.
Conrad, Joseph. Permanent mooring apparatus. 4,312,289, Cl. 114-295.000.
Consiglio Nazionale delle Ricerche: *See—*
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.
Consolidated Foods Corporation: *See—*
Nakhle, George D.; and Bell, Cecil R., Jr., 4,312,608, Cl. 406-171.000.
Consolidated Natural Gas Service Company, Inc.: *See—*
Swenson, Paul F.; and Moore, Paul B., 4,312,188, Cl. 62-160.000.
Constructions Mecaniques Pernin Sarl: *See—*
Avenel, Rene, 4,312,644, Cl. 55-168.000.
Conte, Jean-Francois; and Carles, Henri. Cylinder head gasket for internal combustion engines. 4,312,512, Cl. 277-235.00B.
Convert, Guy; Diamand, Felix; Dufour, Jacques; and Le Bourgeois, Jean-Paul, to C.G.R. MeV. Apparatus for localized heating of a living tissue, using electromagnetic waves of ultra high frequency, for medical applications. 4,312,364, Cl. 128-804.000.
Conway, Julian C.; and Andrews, James. Device to aid in the determination of ovulation in a female mamalian. 4,312,360, Cl. 128-736.000.
Cooper, J. Carl. Method and apparatus for preserving or restoring audio to video synchronization. 4,313,135, Cl. 358-149.000.
Cooper, Lawrence E., to Texas Instruments Incorporated. Glow plug duty cycle modulating apparatus. 4,312,307, Cl. 123-145.00A.
Coors Food Products Company: *See—*
Liggett, James J., 4,312,890, Cl. 426-466.000.
Copal Company Limited: *See—*
Shimizu, Munetaka; and Harada, Hiroyuki, 4,312,597, Cl. 400-621.000.
Coppola, John A.; Hailey, Lawrence N.; and McMurtry, Carl H., to Kennecott Corporation. Sintered silicon carbide ceramic body. 4,312,954, Cl. 501-90.000.
Cordis Corporation: *See—*
Zick, Gregory L., 4,312,332, Cl. 128-635.000.
Corey, Donald W., to Beatrice Foods Co. Expandable carrying case. 4,312,431, Cl. 190-45.000.
Corning Glass Works: *See—*
Allaire, Roger A., 4,312,457, Cl. 220-2.10R.
Sarkar, Arnab, 4,312,654, Cl. 65-3.120.
Cory, Stanley A.; Black, Millard G.; and Scholtz, Gilbert J., to Walt Disney Productions. Turntable joining tracks with linear induction motor control. 4,312,276, Cl. 104-38.000.
Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See—*
Porro, Francesco; Gabriele, Cosimo; and Hotz, Walter, 4,313,056, Cl. 250-442.000.
Cotte, Dietrich; Scheffler, Holger; Beyer, Gunter; Bugge, Dietmar; and Kuhn, Manfred, to VEB Wirkmaschinenbau Karl Marx Stadt. Method and arrangement for needle selection in knitting machines. 4,312,194, Cl. 66-75.200.
Cotton, Worth B., Jr., to Industrial Air, Inc. Air condition system controlled responsive to the absolute humidity of air in a designated treated space. 4,312,189, Cl. 62-176.00C.
Coulton, Steven: *See—*
Rogers, Norman H.; and Coulton, Steven, 4,312,874, Cl. 424-263.000.
Cox, Charles E.; and Eeckhout, Roger V., to SCM Corporation. Combined thermostatic control and thermal fuse overtemperature protector for electrical heating appliances. 4,313,047, Cl. 219-253.000.
Coy, David H.; and Kastin, Abba J., to United States of America, Veterans Administration. Novel derivatives of beta-endorphin, intermediates therefor and compositions and methods employing said derivatives. 4,312,857, Cl. 424-177.000.
Creed, Gerald J.: *See—*
Adams, Kenneth D.; and Creed, Gerald J., 4,312,284, Cl. 112-158.00R.
Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., to Union Carbide Corporation. Polyurethane elastomers prepared from polyol or polymer/polyol-chain extender mixtures. 4,312,973, Cl. 528-75.000.
Croat, John J.: *See—*
Chraplyvy, Andrew R.; Croat, John J.; and Herbst, Jan F., 4,312,684, Cl. 148-121.000.
Crosby, William D., to Allis-Chalmers Corporation. Spring trip mechanism for plows. 4,312,407, Cl. 172-261.000.
Cross, Richard H. Filling aid for plastic trash bags and the like. 4,312,531, Cl. 294-55.000.
Crump, Druce K.: *See—*
Wilson, David A.; Crump, Druce K.; and Griffin, Freddie, Jr., 4,312,815, Cl. 260-429.900.
Crump, John M. Device for carrying and securing skis, boots and poles and process for use. 4,312,532, Cl. 294-147.000.
CTS Corporation: *See—*
Saik, John D.; and English, Jack A., 4,312,118, Cl. 29-594.000.
Culley, Donnell H., Jr. Mine roof support system. 4,312,609, Cl. 405-291.000.
Cuntze, Ulrich; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Surface-active compounds based on natural rosin acids. 4,312,631, Cl. 8-583.000.
Curtis, Anthony T.: *See—*
Knight, Lindsay C.; Curtis, Anthony T.; Phillips, Robert B.; and Bowyer, William H., 4,313,182, Cl. 367-117.000.
D.O.V.E. Equipment Corporation: *See—*
Boettcher, William C., 4,312,460, Cl. 221-75.000.
Daby, Lance H. Proportional pumping apparatus. 4,312,463, Cl. 222-134.000.
Dahmen, Kurt: *See—*
Kuster, Erich; Goossens, Bernhard; Dahmen, Kurt; and Barthell, Eduard, 4,312,998, Cl. 564-205.000.
Daido Metal Company Ltd.: *See—*
Mori, Sanae, 4,312,772, Cl. 252-12.200.
Daigle, Louis J. L., to United Technologies Corporation. Sensor and meter for measuring the mass flow of a fluid stream. 4,312,235, Cl. 73-861.180.
Daimler-Benz Aktiengesellschaft: *See—*
Lahmann, Claus-Peter, 4,312,899, Cl. 427-180.000.
Dainippon Screen Manufacturing Co., Ltd.: *See—*
Ohtani, Masami, 4,312,586, Cl. 354-321.000.
Dakin, Wayne R.: *See—*
Winslow, John S.; and Dakin, Wayne R., 4,313,191, Cl. 369-275.000.
Dale, Charles H., to Pav-Saver Mfg. Co. Wet concrete pavement spreading machine and reinforcing rod layer. 4,312,602, Cl. 404-100.000.
Dall'Acqua, Francesco: *See—*
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.
Dalley, James E.: *See—*
Carbrey, Robert L.; and Dalley, James E., 4,313,225, Cl. 455-602.000.
Dalton, Ronald V.: *See—*
Dalton, Todd E.; and Dalton, Ronald V., 4,312,417, Cl. 180-8.00A.
Dalton, Todd E.; and Dalton, Ronald V. Hand truck employing wheel units having multiple wheels. 4,312,417, Cl. 180-8.00A.
D'Amato, Salvatore F.: *See—*
Weitzen, Edward H.; and D'Amato, Salvatore F., 4,313,087, Cl. 324-65.00R.
Danepak Ltd.: *See—*
Duddridge, John M., 4,312,252, Cl. 83-80.000.
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, to Orthofix S.r.l. External axial fixation unit. 4,312,336, Cl. 128-92.00A.
Daniell, Roy B., Jr. Custom-fitted knee guard and brace. 4,312,335, Cl. 128-80.00C.
Darolia, Ramgopal, to General Electric Company. High temperature article, article retainer, and cushion. 4,312,599, Cl. 403-29.000.
Datafile Limited: *See—*
Barber, Donald T., 4,312,453, Cl. 211-46.000.
Daughenbaugh, Randall J.: *See—*
Ford, Michael E.; and Daughenbaugh, Randall J., 4,313,005, Cl. 564-493.000.

Daverio, Jean-Claude; Bertolotti, Francis; and Weber, Georges. Apparatus for rapidly cooling elongated metallic products during their movement in longitudinal direction by a liquid cooling jet and for removing the latter from the surface of the product after the cooling. 4,312,094, Cl. 15-302.000.

David Manufacturing Co.: *See*—
Braun, Keith A.; and Johannsen, John F., 4,312,750, Cl. 209-291.000.

Davidson, G. Graham, Jr.: *See*—
Drury, Daniel; Drury, Geoffrey; and Davidson, G. Graham, Jr., 4,312,152, Cl. 47-63.000.

Davis, Edwin W., to Eastern Company, The. Flush-mountable lock with actuator disconnect feature. 4,312,203, Cl. 70-472.000.

Davis, Edwin W., to Eastern Company, The. Paddle lock with translatably-mounted handle disconnect member. 4,312,204, Cl. 70-472.000.

Davis, Edwin W.: *See*—
Reed, James A.; and Davis, Edwin W., 4,312,205, Cl. 70-472.000.

Davis, George O., to Scott Paper Company. Pan-type lighting fixture. 4,313,153, Cl. 362-184.000.

Davis, Ken W.; and McCay, Leo B., to Ferrero, Martin P., Trustee; Hensz, Robert L.; Ferrero, Martin P.; and Semmes, J. Gibson. Combustion engine fuel economizer. 4,312,318, Cl. 123-546.000.

Davis, Pauls: *See*—
Nassry, Assadullah; Maxwell, Jerrold F.; Compton, John W.; Panek, Edward J.; and Davis, Pauls, 4,312,768, Cl. 252-32.70E.
Panek, Edward J.; and Davis, Pauls, 4,312,775, Cl. 252-316.000.

Dawless, Robert K., to Aluminum Company of America. Method of silicon purification. 4,312,846, Cl. 423-348.000.

Dawless, Robert K., to Aluminum Company of America. Silicon purification system. 4,312,847, Cl. 423-348.000.

Dawless, Robert K., to Aluminum Company of America. Boron removal in silicon purification. 4,312,848, Cl. 423-348.000.

Day, Charles E., to American Air Filter Company, Inc. Pocket filter arrangement. 4,312,648, Cl. 55-378.000.

Day, Edward A.; Seay, Glenn E.; and Ritter, Petry B., to Systems, Science and Software. Delay detonator device. 4,312,271, Cl. 102-202.130.

Dayco Corporation: *See*—
Kleykamp, Donald L., 4,312,383, Cl. 138-103.000.
Kleykamp, Donald L., 4,312,525, Cl. 285-236.000.

Dean, Raymond H.: *See*—
Edwards, Douglas F.; Zimmer, Ronald S.; and Dean, Raymond H., 4,312,475, Cl. 236-49.000.

De Bastiani, Giovanni: *See*—
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, 4,312,336, Cl. 128-92.00A.

Debiopharm SA: *See*—
Purcell, William P.; and Parish, Harlie A., Jr., 4,312,862, Cl. 424-228.000.

De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, to Sperry Corporation. Combine harvester. 4,312,366, Cl. 130-27.00P.

De Coene, Frans J. G. C.: *See*—
De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, 4,312,366, Cl. 130-27.00P.

DeCoster, David C.: *See*—
Tu, Hosheng; and DeCoster, David C., 4,312,744, Cl. 208-120.000.

De Facci, Claude: *See*—
Duerr, Peter C.; and De Facci, Claude, 4,312,558, Cl. 339-130.00R.

DeFreitas, Richard E., to DeltaLab Research, Inc. Digital encoding circuitry with means to reduce quantization noise. 4,313,204, Cl. 375-28.000.

Degen, Ludwig: *See*—
Olivieri, Roberto; Viglia, Aurelio; Degen, Ludwig; Angelini, Leonello; and Fascetti, Eugenio, 4,312,948, Cl. 435-253.000.

Degenkolb, Eugene O.; Griffiths, James E.; and Mogab, Cyril J., to Bell Telephone Laboratories, Incorporated. Method for the optical monitoring of plasma discharge processing operations. 4,312,732, Cl. 204-192.00E.

De Geus, Donald. Fabric casing for elastic cores such as cushions and the like. 4,312,087, Cl. 5-490.000.

De Jeney, Viktor. Driving device for the elimination of the use of perforations for driving the film of movie cameras, projectors and editors with optical compensator. 4,312,576, Cl. 352-119.000.

DeltaLab Research, Inc.: *See*—
DeFreitas, Richard E., 4,313,204, Cl. 375-28.000.

De Luca, Paul V.; and Rawlings, David, to Porta Systems Corp. Telephone modular distributing frame. 4,313,039, Cl. 179-98.000.

Dependable-Fordath, Inc.: *See*—
Harris, David L.; and Taylor, Colin, 4,312,397, Cl. 164-7.100.

Derfler, Sara; Gur, Maksim; and Wagner, Daniel B., to Ames-Yissum Ltd. Immunoassay for thyroid stimulating hormone employing florisil adsorbent as separating agent. 4,312,854, Cl. 424-1.000.

de Ronde, Francois C., to U.S. Philips Corporation. Image frequency reflection mode filter for use in a high-frequency receiver. 4,313,097, Cl. 333-204.000.

DeSantis, Charles M.: *See*—
Campbell, Donn V.; DeSantis, Charles M.; and Wills, John R., 4,313,121, Cl. 343-790.000.

Desautels, David P.: *See*—
Quanbeck, Sherman H.; Ringdahl, Albert O.; and Desautels, David P., 4,312,621, Cl. 414-523.000.

Design & Funding, Inc.: *See*—
Melsheimer, Stephen T., 4,312,889, Cl. 426-86.000.

Desom, Albert. Method and device for pressing and pleating overcapping caps of the foil type onto bottle necks. 4,312,168, Cl. 53-49.000.

DeSoto, Inc.: *See*—
Jasenof, Kenneth E.; and Wichmann, James W., 4,312,800, Cl. 260-29.60E.
Sekmakas, Kazys; and Shah, Raj, 4,312,799, Cl. 260-29.300.

Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, to Kowa Company, Ltd. Antibiotic KA-7038 and compositions containing same. 4,312,858, Cl. 424-181.000.

Deutsch, Reinhard: *See*—
Erdmann, Otto; and Deutsch, Reinhard, 4,312,699, Cl. 156-477.00R.

Deutsche Star Kugelhalter GmbH: *See*—
Blaurock, Gunter; Albert, Ernst; Reichert, Klaus; and Schlereth, Rudolf, 4,312,545, Cl. 308-6.00C.

Devanney, John W. Process of producing a non-agglomerating vanadium coated particle. 4,312,919, Cl. 428-403.000.

Devanney, John W., III. Fluid bed combuster. 4,312,135, Cl. 34-10.000.

De Wald, Dennis G.: *See*—
Enterline, William R.; De Wald, Dennis G.; and Boose, James R., 4,312,265, Cl. 99-348.000.

Dewey, John L., to Reynolds Metals Company. Nitric acid reconstitution. 4,312,852, Cl. 423-393.000.

Dexter, Donald D.: *See*—
Adams, John H.; and Dexter, Donald D., 4,312,767, Cl. 252-25.000.

Diamand, Felix: *See*—
Convert, Guy; Diamand, Felix; Dufour, Jacques; and Le Bourgeois, Jean-Paul, 4,312,364, Cl. 128-804.000.

Diamond Oil Well Drilling Company: *See*—
Park, Arthur, 4,312,414, Cl. 175-59.000.

Diebold Incorporated: *See*—
Graef, Harry T.; Mercer, Scott A.; and Hill, Jeffrey A., 4,312,277, Cl. 109-24.100.

Diedrich, Heinz; Fazi, Marco; Fanti, Domenico; Mercuri, Angelo; and Tranquilli, Romolo. Process to obtain multielement linear bidimensional infrared detectors having improved exactness of geometry and high degree of integration. 4,312,115, Cl. 29-572.000.

Dietl, Josef; Holm, Claus; and Sirtl, Erhard, to Helictronic Forschungs- und Entwicklungs- Gesellschaft fur Solarzellen-Grundstoffe mbH. Semicontinuous process for the manufacture of pure silicon. 4,312,850, Cl. 423-350.000.

Dietz, Richard E., to Phillips Petroleum Co. Polymerization of olefins. 4,312,968, Cl. 526-125.000.

DiGiulio, Adolph V.; and Bauer, Jack N., to Atlantic Richfield Company. Fire-retardant, rubber-modified, monocarboxylic acid copolymers. 4,312,958, Cl. 521-88.000.

Discovision Associates: *See*—
Slaten, Gary G., 4,313,190, Cl. 369-275.000.
Winslow, John S.; and Dakin, Wayne R., 4,313,191, Cl. 369-275.000.

Doan, Rosetta C. Apparatus for collecting seminal fluids. 4,312,350, Cl. 128-276.000.

Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, to Robert Bosch GmbH. Apparatus for detecting pressure fluctuations in the combustion chamber of an internal combustion engine. 4,312,215, Cl. 73-35.000.

Dock, John C.: *See*—
Kramer, Dennis M.; and Dock, John C., 4,312,214, Cl. 73-35.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,312,712, Cl. 202-229.000.

Dr. Carl Hahn, G.m.b.H.: *See*—
Friese, Axel, 4,312,348, Cl. 128-263.000.

Dr. E. Fresenius Chem.-pharm Industrie KG: *See*—
Hartert, Hellmut, 4,312,217, Cl. 73-64.100.

Dr. L. Zambeletti S.p.A.: *See*—
Caruso, Innocenzo; Montrone, Franco; and Molteni, Luigi, 4,312,866, Cl. 424-244.000.

Dolan, James G.: *See*—
Becker, Harold L.; Buriks, Rudolf S.; and Dolan, James G., 4,312,969, Cl. 526-206.000.

Doles, Glenn P.; and Beran, James J., to Oak Industries Inc. Cable TV security means. 4,313,132, Cl. 358-114.000.

Dolhyj, Serge R.; and Pepera, Marc A., to Standard Oil Company. Coated catalysts containing high loading of active phase, particularly useful in the preparation of maleic anhydride. 4,312,787, Cl. 252-435.000.

Dollison, William W., to Otis Engineering Corporation. Tool diverter. 4,312,378, Cl. 137-625.440.

Domen, Steve R., to United States of America, America. Absorbed dose water calorimeter. 4,312,224, Cl. 73-190.0EW.

Domenech, Michel. Solar swimming-pool water heater. 4,312,323, Cl. 126-415.000.

Domtar Inc.: *See*—
Tomlinson, George H., II, 4,312,702, Cl. 162-30.00R.

Donachy, James H.: *See*—
Pierce, William S.; and Donachy, James H., 4,312,920, Cl. 428-425.500.

Donadelli, Franco. Method for restoring optimum skin conditions, especially for partially or entirely healing intradermal tears. 4,312,340, Cl. 128-207.210.

Donaher, Charles J.; and Christensen, Gordon D., to Thomas & Betts Corporation. Receptacle for stacking electronic packages. 4,312,555, Cl. 339-75.0MP.

Donck, Harry A.: *See—*
Snyder, Harold J., Jr.; Veca, Anthony R.; and Donck, Harry A., 4,312,706, Cl. 376-442.000.
Donn Incorporated: *See—*
Teli, Jonathan P.; and Worley, Robert F., 4,312,158, Cl. 52-39.000.
Donohue, Brian T. Cannula and drill guide apparatus. 4,312,337, Cl. 128-92.0EB.
Dorosz, Adolph S.; and Martin, John F., to USM Corporation. Positioning apparatus. 4,312,282, Cl. 112-121.120.
Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, to Feldmuhle Aktiengesellschaft. Femur head cap for endoprosthesis. 4,312,079, Cl. 3-1.913.
Doumoto, Yasuo: *See—*
Maezawa, Kazuo; and Doumoto, Yasuo, 4,312,596, Cl. 366-343.000.
Dow Chemical Co., The: *See—*
Lefevre, Joseph D., 4,312,720, Cl. 204-78.000.
McIntyre, John M.; and Caldwell, Donald L., 4,312,723, Cl. 204-98.000.
McLaurin, Charles H.; and Nelson, Wayne F., 4,312,406, Cl. 166-386.000.
Suh, Kyung W.; and Jones, Jonathan R., 4,312,910, Cl. 428-220.000.
Wilson, David A.; Crump, Druce K.; and Griffin, Freddie, Jr., 4,312,815, Cl. 260-429.900.
Dow Corning Corporation: *See—*
Gaul, John H., Jr., 4,312,970, Cl. 526-279.000.
Hwang, Sun-Tak, 4,312,755, Cl. 210-321.100.
Doyen, Joel; and Raisin, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche. Device for the linear treatment of a curved edge of a supple piece of fabric or other material. 4,312,281, Cl. 112-121.110.
Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal imidazolylenol ethers. 4,312,880, Cl. 424-273.00R.
Dragerwerk Aktiengesellschaft: *See—*
Hahmann, Gunther, 4,312,331, Cl. 128-1.00B.
Drain, David J.: *See—*
Clough, David; Drain, David J.; and Ruder, Gary C. F., 4,312,833, Cl. 422-30.000.
Draloric Electronic GmbH: *See—*
Fink, Rudolf, 4,313,157, Cl. 363-59.000.
Dresser Industries, Inc.: *See—*
Pillow, Dan L., 4,312,412, Cl. 173-17.000.
Drexler, Jerome; and Bouldin, Eric W., to Drexler Technology Corporation. Method for making a broadband reflective laser recording and data storage medium with absorptive underlayer. 4,312,938, Cl. 430-496.000.
Drexler Technology Corporation: *See—*
Drexler, Jerome; and Bouldin, Eric W., 4,312,938, Cl. 430-496.000.
Dreybus, Gail B. Tactile stimulating mechanism. 4,312,333, Cl. 128-49.000.
Drori, Mordeki. Differential-pressure valve. 4,312,374, Cl. 137-469.000.
Drucker, Eric R., to John Fluke Mfg. Co., Inc. Phase-locked loop frequency synthesizer including compensated phase and frequency modulation. 4,313,209, Cl. 455-112.000.
Drury, Daniel; Drury, Geoffrey; and Davidson, G. Graham, Jr., to Agrownautics, Inc. Buoyant support structure and system and method using structure for water culture of plants. 4,312,152, Cl. 47-63.000.
Drury, Geoffrey: *See—*
Drury, Daniel; Drury, Geoffrey; and Davidson, G. Graham, Jr., 4,312,152, Cl. 47-63.000.
DuBois, Chester G.: *See—*
McChesney, Richard M.; and DuBois, Chester G., 4,312,314, Cl. 123-438.000.
Duddridge, John M., to Danepak Ltd. Food slicers. 4,312,252, Cl. 83-80.000.
Duerr, Peter C.; and De Facci, Claude. Flush mounted plug. 4,312,558, Cl. 339-130.00R.
Dufau, Oscar. Electrical connector. 4,312,556, Cl. 339-99.00R.
Dufour, Jacques: *See—*
Convert, Guy; Diamand, Felix; Dufour, Jacques; and Le Bourgeois, Jean-Paul, 4,312,364, Cl. 128-804.000.
Dufour, Paul: *See—*
Vrancken, August; and Dufour, Paul, 4,312,726, Cl. 204-159.230.
Duginov, Leonid A.: *See—*
Avrukh, Vladimir J.; Duginov, Leonid A.; Azbukin, Jury I.; Shelepov, Valery A.; and Gurevich, Elrikh I., 4,313,068, Cl. 310-58.000.
Dunbar, David R., to Interpace Corporation. Electrical transmission system conductor installation technique. 4,312,495, Cl. 254-134.3PA.
Du Pont de Nemours, E. I., and Company: *See—*
Baker, William B.; and May, Joe T., 4,312,593, Cl. 356-414.000.
Weigert, Frank J., 4,313,003, Cl. 564-463.000.
Dupressoir, Albert; and Bloch, Claude, to Thomson-CSF. Open cavity radiating source excited by a dipole. 4,313,122, Cl. 343-818.000.
Durcan, John W. Vehicle cleaning apparatus. 4,312,090, Cl. 15-53.00A.
Duriron Company, Inc., The: *See—*
Winegar, Donald L.; and Arde, Joseph M., Jr., 4,312,961, Cl. 525-4.000.
Duskin Franchise Co., Ltd.: *See—*
Matsuda, Noboru, 4,312,771, Cl. 252-107.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Klemens; and Aigner, Erich, 4,312,288, Cl. 114-264.000.
Dzadzic, Peter M.: *See—*
Weil, Thomas A.; Dzadzic, Peter M.; Shih, Chien-Cheng J.; and Price, Michael C., 4,313,011, Cl. 585-240.000.
E. R. Squibb & Sons, Inc.: *See—*
Haugwitz, Rudiger D., 4,312,809, Cl. 260-325.0PH.
Haugwitz, Rudiger D., 4,312,990, Cl. 548-379.000.
Eastern Company, The: *See—*
Davis, Edwin W., 4,312,203, Cl. 70-472.000.
Davis, Edwin W., 4,312,204, Cl. 70-472.000.
Pastva, John V., Jr.; and Pelcin, Albert L., 4,312,202, Cl. 70-472.000.
Reed, James A.; and Davis, Edwin W., 4,312,205, Cl. 70-472.000.
Eastman Kodak Company: *See—*
Blair, Gerald E.; Merry, J. Bradford; and Wylot, James M., 4,312,660, Cl. 65-85.000.
Hunt, Keith, 4,312,985, Cl. 542-457.000.
Lee, J. Kelly, 4,312,584, Cl. 354-266.000.
Eaton Corporation: *See—*
Bopp, Warren G., 4,312,433, Cl. 192-58.00B.
Calviello, Joseph A., 4,312,112, Cl. 29-571.000.
Calviello, Joseph A., 4,312,113, Cl. 29-571.000.
Eaton-Kenway, Inc.: *See—*
Allred, James K.; and Quinn, Edward B., 4,312,623, Cl. 414-786.000.
Ebauches Electroniques SA: *See—*
Claude, Mutrux, 4,313,064, Cl. 307-475.000.
Ebauches S.A.: *See—*
Randin, Jean-Paul, 4,312,929, Cl. 429-188.000.
Eberhardt, Kurt: *See—*
Bahner, Friedrich; Eberhardt, Kurt; and Lotz, Ernst, 4,312,136, Cl. 34-35.000.
Eby, Donald A.: *See—*
Martin, Robert F.; Eby, Donald A.; and Huebsch, Donald L., 4,312,436, Cl. 194-4.00R.
Eckles, Robert D., to Li-Cor, Inc. Porometer and method for stomatal measurements. 4,312,218, Cl. 73-76.000.
Eder, Kenneth C., to Texas Instruments Incorporated. Light energy information transmission system. 4,313,227, Cl. 455-617.000.
Edward, John C.; and Edward, Robert M., Jr. Hardness tester mounting apparatus. 4,312,221, Cl. 73-81.000.
Edward, Robert M., Jr.: *See—*
Edward, John C.; and Edward, Robert M., Jr., 4,312,221, Cl. 73-81.000.
Edwards, Douglas F.; Zimmer, Ronald S.; and Dean, Raymond H., to Tempmaster Corporation. Flow adjustment mechanism for air distributor systems. 4,312,475, Cl. 236-49.000.
Edwards, John D.: *See—*
Jabara, Michael D.; Jolissaint, Charles H.; Lieberman, David; and Edwards, John D., 4,313,036, Cl. 179-18.0AD.
Eeckhout, Roger V.: *See—*
Cox, Charles E.; and Eeckhout, Roger V., 4,313,047, Cl. 219-253.000.
Ehrgott, Frederick J.: *See—*
Klioze, Solomon S.; and Ehrgott, Frederick J., 4,312,876, Cl. 424-267.000.
Ehrhart, Dale L. Corrosion indicator. 4,313,042, Cl. 200-61.040.
Eichberger, Heinz: *See—*
Serbent, Harry; Reuter, Gerhard; Schnabel, Wolfram; and Eichberger, Heinz, 4,312,666, Cl. 75-11.000.
Eisfeldt, Herbert R., to Kraft, Inc. Shelf stable dessert product and method for manufacture thereof. 4,312,891, Cl. 426-573.000.
Electric Power Research Institute, Inc.: *See—*
Lee, Ilyoul, 4,313,146, Cl. 361-85.000.
Pearce, Henry A.; Voytik, Paul; and Walsh, Edward J., 4,312,794, Cl. 252-581.000.
Ellcon-National, Inc.: *See—*
Beacon, Robert G., 4,312,428, Cl. 188-52.000.
Ellington, David L., to Maytag Company, The. Control system for fabric drying apparatus. 4,312,138, Cl. 34-45.000.
Eltra Corporation: *See—*
Pelster, James J., 4,312,448, Cl. 206-409.000.
Engelhard Minerals & Chemicals Corporation: *See—*
Wills, Walter R., 4,312,729, Cl. 204-180.00P.
Engelhart, Raymond E. Invalid's wheeled walker. 4,312,505, Cl. 272-70.300.
Englander, Gary E.: *See—*
Fournier, Roger H.; Chase, Richard P.; and Englander, Gary E., 4,312,154, Cl. 51-101.00R.
Engler, Edward M.; Kuptsis, John D.; Schad, Robert G.; and Tomkiewicz, Yaffa, to International Business Machines Corporation. Class of E-beam resists based on conducting organic charge transfer salts. 4,312,935, Cl. 430-296.000.
Engler, Edward M.; Kuptsis, John D.; Schad, Robert G.; and Tomkiewicz, Yaffa, to International Business Machines Corporation. Class of E-beam resists based on conducting organic charge transfer salts. 4,312,936, Cl. 430-296.000.
Engler, Edward M.; Patel, Vishnubhai V.; and Schumaker, Robert R., to International Business Machines Corporation. Dithiobenzoate 4,5-dicyano-1,3-(dithiolidene-2-yl)methylene. 4,312,991, Cl. 549-39.000.
Englert, Norbert, to Karl Mayer Textilmaschinenfabrik GmbH. Guidebar shogging guide apparatus for warp knitting machines. 4,312,196, Cl. 66-207.000.
English, Jack A.: *See—*
Saik, John D.; and English, Jack A., 4,312,118, Cl. 29-594.000.

Enomoto, Junzo: *See*—
Yamazaki, Hitoshi; Ito, Hiroshi; Takeda, Toshiyuki; and Enomoto, Junzo, 4,312,895, Cl. 427-67.000.

Enterline, William R.; De Wald, Dennis G.; and Boose, James R., to Koppers Company, Inc. Screw for extruding a food mash. 4,312,265, Cl. 99-348.000.

Envoys U.S.A., Inc.: *See*—
Gamm, Robert J., 4,312,076, Cl. 2-199.000.

Eocom Corporation: *See*—
Harbaugh, Steven K., 4,312,590, Cl. 355-51.000.

Eppler, Richard A., to Mobay Chemical Corporation. Low-melting, lead-free ceramic frits. 4,312,951, Cl. 501-24.000.

Epstein, Ronald: *See*—
Mink, Robert; and Epstein, Ronald, 4,312,782, Cl. 252-429.00B.

Erdmann, Otto; and Deutsch, Reinhard, to Hauni-Werke Korber & Co. K.G. Apparatus for attaching adhesive-coated sheets to cigarette packs or the like. 4,312,699, Cl. 156-477.00R.

Ericson, Kjell Y.: *See*—
Korduner, Hans M.; Gyllang, Hans E.; and Ericson, Kjell Y., 4,312,856, Cl. 424-145.000.

Esaki, Hisao; and Uchida, Yoshiro, to Nippondenso Co., Ltd. Air cleaner housing. 4,312,651, Cl. 55-502.000.

Escher Wyss GmbH: *See*—
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, 4,312,139, Cl. 34-54.000.

Eta A.G. Ebauches-Fabrik: *See*—
Perucchi, Norberto; and Mock, Elmar, 4,312,119, Cl. 29-596.000.

Eumig Elektrizitats- und Metallwaren-Industrie Gesellschaft m.b.H.: *See*—
Schwomma, Otto; Raimann, Gerhard; and Breit, Hans P., 4,312,580, Cl. 354-64.000.

Evans, Lawrence E.: *See*—
Magoon, Keith E.; Evans, Lawrence E.; and Hembrough, Frederick B., 4,312,347, Cl. 128-260.000.

Evans Medical Limited: *See*—
Futter, Bernard V., 4,312,893, Cl. 427-3.000.

Evans, Robert T.: *See*—
Cefarelli, Frank P.; and Evans, Robert T., 4,312,564, Cl. 350-96.220.

EVG Entwicklungs -u. Verwertungs-Gesellschaft m.b.H.: *See*—
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,312,243, Cl. 74-346.000.

Exploration Logging, Inc.: *See*—
Koci, Christopher E., 4,312,223, Cl. 73-151.000.

Exxon Research & Engineering Co.: *See*—
Grimes, Patrick G.; Zahn, Markus; and Bellows, Richard J., 4,312,735, Cl. 204-228.000.
Logie, James A., 4,313,139, Cl. 358-281.000.
Stephens, Richard B., 4,313,023, Cl. 136-246.000.
Stephens, Walter R.; and Berstein, Patricio, 4,313,168, Cl. 364-465.000.

Ezoe, Takuji, to Ezoe, Takuji. Multi-blade ditching machine. 4,312,144, Cl. 37-98.000.

Fabrique Nationale Herstal, en abrege F.N.: *See*—
Bourlet, Maurice V., 4,312,263, Cl. 89-154.000.

Faccioli, Giovanni: *See*—
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, 4,312,336, Cl. 128-92.00A.

FAG Kugelfischer Georg Schafer & Co.: *See*—
Bayer, Oswald; Heinz, Werner; and Rudloff, Georg, 4,312,546, Cl. 308-187.000.

Falleroni, Charlene A.: *See*—
Neely, James E., Jr.; Falleroni, Charlene A.; Moff, Annette; and Lin, Chia-Cheng, 4,312,844, Cl. 423-314.000.

Fan, John C. C., to Massachusetts Institute of Technology. Cermet film selective black absorber. 4,312,915, Cl. 428-323.000.

Fanti, Domenico: *See*—
Diedrich, Heinz; Fazi, Marco; Fanti, Domenico; Mercuri, Angelo; and Tranquilli, Romolo, 4,312,115, Cl. 29-572.000.

Farha, Floyd, Jr.: *See*—
McGinnis, Roger N.; Gardner, Lloyd E.; and Farha, Floyd, Jr., 4,313,017, Cl. 585-266.000.

Farina, Attilio; and Belisomi, Pietro, to Italiana S.p.A. Indesit Industria Elettrodomestici. Computer controlled television receiver with display. 4,313,213, Cl. 455-158.000.

Fascetti, Eugenio: *See*—
Olivieri, Roberto; Viglia, Aurelio; Degen, Ludwig; Angelini, Leonello; and Fascetti, Eugenio, 4,312,948, Cl. 435-253.000.

Fattinger, Volker; and Schneider, Jug, to Ciba-Geigy Corporation. Gas scrubbing tower. 4,312,646, Cl. 55-218.000.

Faulkner, Keith; and Appleford, David E., to Portionmat (Engineering) Limited. Weighing and dispensing unit. 4,312,462, Cl. 222-56.000.

Faust, Wilfried: *See*—
Schmidt, Robert R.; and Faust, Wilfried, 4,312,664, Cl. 71-92.000.

Favareto, Marcello, to Comau S.p.A. Manipulator. 4,312,622, Cl. 414-730.000.

Fazi, Marco: *See*—
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FBC Limited: *See*—
Puri, Rishi R.; and Collington, Kenneth T., 4,312,776, Cl. 252-350.000.

Feldmuhle Aktiengesellschaft: *See*—
Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, 4,312,079, Cl. 3-1.913.

Ferguson, Donald C.: *See*—
Smith, Merrill M.; Holmstrom, Ernest R.; and Ferguson, Donald C., 4,312,686, Cl. 156-209.000.

Fergusson, John D. Cutting device for use in kite fighting. 4,312,129, Cl. 30-296.00R.

Ferrero, Martin P.: *See*—
Davis, Ken W.; and McCay, Leo B., 4,312,318, Cl. 123-546.000.

Ferrero, Martin P., Trustee: *See*—
Davis, Ken W.; and McCay, Leo B., 4,312,318, Cl. 123-546.000.

Feurstein, Guntram: *See*—
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, 4,312,139, Cl. 34-54.000.

Fichtel & Sachs AG: *See*—
Wossner, Felix; Itzinger, Hermann; Handke, Gunther; and Koch, Wilhelm, 4,312,499, Cl. 267-8.00R.

Fickenscher, Hermann; Hock, Richard H.; Ray, Richard C.; and Scuderi, Rudolph, to Bell Telephone Laboratories, Incorporated. Uninterruptible power supply with load regulation of standby voltage source. 4,313,060, Cl. 307-23.000.

Figini, Alessandro: *See*—
Boffito, Claudio; Barosi, Aldo; and Figini, Alessandro, 4,312,669, Cl. 75-177.000.

Filderman, Rene G., to Societe Anonyme Francaise du Ferodo. Hydraulic control for automobile brakes. 4,312,182, Cl. 60-581.000.

Finegold, Hyman B., to Globe Tool and Engineering Company, The. Apparatus for making dynamoelectric field member. 4,312,387, Cl. 140-92.200.

Fink, Rudolf, to Draloric Electronic GmbH. Capacitive network. 4,313,157, Cl. 363-59.000.

Finnila, Ronald M.: *See*—
Su, Stephen C.; and Finnila, Ronald M., 4,313,127, Cl. 357-30.000.

Finsterwalder, Klemens; and Aigner, Erich, to Dyckerhoff & Widmann Aktiengesellschaft. Floating structure for effecting energy transformation from sea water. 4,312,288, Cl. 114-264.000.

Fischer, Jochen; and Scholl, Hans, to Kochs Adler AG. Automatic sewing machine having control circuit receiving a signal measuring adjustment of work receiving means. 4,312,283, Cl. 112-121.120.

Fischer, Karl. Cooking unit. 4,313,052, Cl. 219-446.000.

Fischer & Porter Company: *See*—
Hermanns, Henry M., 4,312,240, Cl. 73-861.570.

Fischer, William C.; and Sivahop, Albert, to United Technologies Corporation. Tested, dissimilar helicopter stability augmentation. 4,313,201, Cl. 371-68.000.

Fisher, Edward S., to United States of America, Energy. Single crystal metal wedges for surface acoustic wave propagation. 4,313,070, Cl. 310-313.00R.

Fisher, Warren; and Smith, Frank J., Jr., to United States Gypsum Company. Automatic lid placing apparatus for large plastic lids and method for placing lids. 4,312,172, Cl. 53-489.000.

Fitzgerald, J. Vincent. Motor vehicle map display system. 4,312,577, Cl. 353-12.000.

Fleet Industries: *See*—
Norminton, Robert S., 4,312,496, Cl. 254-302.000.

Fleischer, Paul E., to Bell Telephone Laboratories, Incorporated. Parasitic-free switched capacitor network. 4,313,096, Cl. 333-173.000.

Flickinger, William T.; and Staiger, Donald W., to HPM Corporation. Method for opening die sections. 4,312,828, Cl. 264-349.000.

Florentine, Robert A. Apparatus for weaving a three-dimensional article. 4,312,261, Cl. 87-33.000.

Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., to Givaudan Corporation. 2-Hydroxymethylenecyclohexanones. 4,313,007, Cl. 568-376.000.

FMC Corporation: *See*—
Anderson, James M.; Hassel, Richard O.; Inghram, Donald M.; and Winkler, Edwin, 4,312,619, Cl. 414-347.000.
Vadas, Leslie, 4,312,171, Cl. 53-403.000.

Foerster, Karl-Heinz: *See*—
Johne, Hans; Lucas, Christian; Foerster, Karl-Heinz; Schanze, Klaus; Jentsch, Arndt; Mueller, Wolfgang; and Schulz, Horst, 4,312,137, Cl. 34-43.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Self standing flanged tray with integral lid. 4,312,451, Cl. 206-628.000.

Ford Aerospace & Communications Corp.: *See*—
Westerman, Charles W., 4,313,120, Cl. 343-771.000.

Ford, Michael E.; and Daughenbaugh, Randall J., to Air Products and Chemicals, Inc. Inhibiting amidine formation during hydrogenation of organo nitriles. 4,313,005, Cl. 564-493.000.

Ford Motor Company: *See*—
Simpson, Leslie G., 4,312,900, Cl. 427-181.000.

Forgeng, William D.: *See*—
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., 4,312,894, Cl. 427-34.000.

Fosker, George R.; and Burton, George, to Beecham Group Limited. α-Acylureidocephalosporins and salts and esters thereof. 4,312,982, Cl. 542-418.000.

Foster, Daniel F. Computer work station assembly and mounting apparatus therefor. 4,313,112, Cl. 340-700.000.

Fourcher, Fredric J. Molding method. 4,312,829, Cl. 264-571.000.

Fournier, Roger H.; Chase, Richard P.; and Englander, Gary E., to Warner & Swasey Company, The. Grinding machine and method. 4,312,154, Cl. 51-101.00R.

Fowler, David M., III: *See*—
Funk, Buddy K.; and Fowler, David M., III, 4,313,109, Cl. 340-365.00P.

Fowler, Donald W.: *See—*
Clelford, Douglas H.; and Fowler, Donald W., 4,313,165, Cl. 364-424.000.
Franks, Robert L., Jr., to Well Tools, Inc. Reverse circulating tool. 4,312,415, Cl. 175-215.000.
Franz Plasser Bahnbaumaschi nen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; Bock, Gernot; and Ganguly, Mihir, 4,312,275, Cl. 104-12.000.
Fratelli Borletti S.p.A.: *See—*
Broetto, Costantino, 4,313,102, Cl. 340-59.000.
Fredericks, Glen R.: *See—*
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., 4,313,007, Cl. 568-376.000.
Freese, Gary P.; and Trayler, Robert J., to Caterpillar Tractor Co. Slide rail assembly for a work vehicle. 4,312,411, Cl. 172-823.000.
Freihage, Robert P. Disced friction heater. 4,312,322, Cl. 126-247.000.
Freimiller, Gary L.: *See—*
Markezich, Ronald L.; Freimiller, Gary L.; Olander, Walter K.; and Axelrod, Robert J., 4,312,803, Cl. 260-45.7PH.
Friese, Axel, to Dr. Carl Hahn, G.m.b.H. Tampon pack with a lubricant depot in the packaging. 4,312,348, Cl. 128-263.000.
Frisk, Olof E., to Mo och Domsjo Aktiebolag. Apparatus for removing particulate material from a pile. 4,312,441, Cl. 198-519.000.
Fritz Eichenauer, Firma: *See—*
Meywald, Klaus; and Ohnmacht, Helmut, 4,313,049, Cl. 219-375.000.
Fritz Haug AG: *See—*
Wanner, Hans; and Boppart, Kurt, 4,312,106, Cl. 29-156.50R.
Frohberger, Paul-Ernst: *See—*
Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,312,880, Cl. 424-273.00R.
Fu, Chuen-Cheng; and Arya, Satya P., to Ingersoll-Rand Co. Friction rock stabilizer set, and a method of fixing a friction rock stabilizer in an earth structure bore. 4,312,604, Cl. 405-259.000.
Fuchs, Otto, to Hoechst Aktiengesellschaft. Monoazo compounds, process for their manufacture and their use. 4,312,807, Cl. 260-154.000.
Fuji Photo Film Co., Ltd.: *See—*
Nakamura, Taku; and Nagatomo, Shigeru, 4,312,940, Cl. 430-510.000.
Otsu, Takatoshi; Tanaka, Yasunobu; Fukushima, Osamu; Mituhashi, Takeshi; Mizuno, Tadatune; Ogawa, Toshiko; and Ichikawa, Kazuo, 4,312,585, Cl. 354-321.000.
Fujii, Hisashi; Kamitake, Mikio; Mimura, Ryohei; and Umezawa, Katsumi, to Kawaski Jukogyo Kabushiki Kaisha. Fuel vapor arresting means for motorcycle engine fuel system. 4,312,649, Cl. 55-387.000.
Fujitsu Fanuc Limited: *See—*
Ishida, Hiroshi; and Asahara, Sunao, 4,313,058, Cl. 250-553.000.
Fujitsu Limited: *See—*
Hirose, Yoshinao; Yamamoto, Haruhiko; Suzuki, Keizo; Fukuchi, Isao; and Tsuchiya, Masahiro, 4,313,149, Cl. 361-394.000.
Nakano, Tokutaka; Sakata, Takao; Iwama, Masamichi; and Isago, Takao, 4,313,193, Cl. 370-43.000.
Yamada, Seiichi; Kamehara, Nobuo; Hashimoto, Kaoru; Yokoyama, Hiromitsu; Niwa, Koichi; and Murakawa, Kyohei, 4,313,026, Cl. 174-68.500.
Fujitsu-Ten, Ltd.: *See—*
Ito, Tatsuo, 4,313,214, Cl. 455-160.000.
Fujiwara, Toshihide: *See—*
Kamachi, Shinichi; and Fujiwara, Toshihide, 4,312,728, Cl. 204-180.00S.
Fukami, Takushi: *See—*
Yamamoto, Kiyokazu; Fukami, Takushi; and Takashima, Teruo, 4,313,073, Cl. 318-577.000.
Fukuchi, Isao: *See—*
Hirose, Yoshinao; Yamamoto, Haruhiko; Suzuki, Keizo; Fukuchi, Isao; and Tsuchiya, Masahiro, 4,313,149, Cl. 361-394.000.
Fukui, Tutomu, to Universal Pioneer Corporation. Video signal time base error correction circuit. 4,313,129, Cl. 358-8.000.
Fukuroi, Takeo, to Yoshida Kogyo K K. Sealing slide fastener stringer. 4,312,102, Cl. 24-205.10R.
Fukushima, Jun, to Pioneer Electronic Corporation. Scrambling and descrambling system in CATV broadcasting system. 4,313,133, Cl. 358-118.000.
Fukushima, Osamu: *See—*
Otsu, Takatoshi; Tanaka, Yasunobu; Fukushima, Osamu; Mituhashi, Takeshi; Mizuno, Tadatune; Ogawa, Toshiko; and Ichikawa, Kazuo, 4,312,585, Cl. 354-321.000.
Funabashi, Kiyomi: *See—*
Tsuchiya, Hiroyuki; Funabashi, Kiyomi; and Kikuchi, Makoto, 4,312,647, Cl. 55-387.000.
Funabiki, Kunio: *See—*
Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, 4,312,795, Cl. 260-18.00R.
Funk, Buddy K.; and Fowler, David M., III, to Sperry Corporation. Initialization control for light beam position indicator. 4,313,109, Cl. 340-365.00P.
Funke, Hermann D., to Medtronic B.V. Heart pacemaker. 4,312,355, Cl. 128-419.0PG.
Furst, Andor; Labler, Ludwig; and Meier, Werner, to Hoffmann-La Roche Inc. Process for the manufacture of cholesterol derivatives. 4,312,812, Cl. 260-397.200.
Futter, Bernard V., to Evans Medical Limited. Coating of tablets. 4,312,893, Cl. 427-3.000.
G.B.R., Ltd.: *See—*
Golicz, Roman M.; Gunther, William H., Jr.; and Hough, James W., 4,312,169, Cl. 53-206.000.
G. D. Searle & Co.: *See—*
Collins, Paul W., 4,312,994, Cl. 560-121.000.
Lambert, Howard J.; and Pitzele, Barnett S., 4,312,806, Cl. 260-149.000.
Gabler, Egmont; and Lehmann, Uwe, to Siemens Aktiengesellschaft. Receiver for high frequency electromagnetic oscillations having a frequency readjustment. 4,313,219, Cl. 455-260.000.
Gabriele, Cosimo: *See—*
Porro, Francesco; Gabriele, Cosimo; and Hotz, Walter, 4,313,056, Cl. 250-442.000.
Gaertner, Van R., to Monsanto Company. N-Substituted carboxy-N-phosphonomethylglycines and the salts thereof as herbicides. 4,312,662, Cl. 71-86.000.
GAF Corporation: *See—*
Barabas, Eugene S.; Mallya, Prakash; and Gromelski, Stanley J., Jr., 4,312,995, Cl. 560-194.000.
Gallagher, James A.; and Brizgys, Bernardas, to BASF Wyandotte Corporation. Zirconium and mercury compounds as co-catalysts for the preparation of noncellular polyurethanes. 4,312,971, Cl. 528-56.000.
Galland Henning Nopak Inc.: *See—*
Nunnemacher, Hermann A.; and Weil, Peter, Jr., 4,312,264, Cl. 92-161.000.
Gamm, Robert J., to Envoys U.S.A., Inc. Cap with integral pocket. 4,312,076, Cl. 2-199.000.
Ganguly, Mihir: *See—*
Theurer, Josef; Bock, Gernot; and Ganguly, Mihir, 4,312,275, Cl. 104-12.000.
Ganzhorn, Harry E., to Raychem Corporation. Method for bonding to polymeric clad optical waveguides. 4,312,571, Cl. 350-320.000.
Garay, Oscar M.; and Siwiak, Kazimierz, to Motorola, Inc. Dual mode transceiver antenna. 4,313,119, Cl. 343-702.000.
Gardner, Lloyd E.: *See—*
McGinnis, Roger N.; Gardner, Lloyd E.; and Farha, Floyd, Jr., 4,313,017, Cl. 585-266.000.
Garrett Corporation, The: *See—*
Meisner, David J., 4,312,484, Cl. 244-17.170.
Gates, Albert G. R., to Gestestner Limited. Stencil duplicator. 4,312,270, Cl. 101-122.000.
Gates Rubber Company, The: *See—*
Gibbs, Ralph H.; and Stuemky, Robert E., 4,312,193, Cl. 64-9.00R.
Gatsis, John G., to UOP Inc. Process for deashing primary coal liquids. 4,312,747, Cl. 208-177.000.
Gatti, Luigi, to Harp S.a.S. di Luigi Gatti & C. Sound diffusion plant with very low directivity. 4,312,420, Cl. 181-146.000.
Gaul, John H., Jr., to Dow Corning Corporation. Silazane polymers from $\{R'_3Si\}_2NH$ and organochlorosilanes. 4,312,970, Cl. 526-279.000.
Gazdecki, Frank J.: *See—*
Charneski, Mitchell D.; Kelley, James K.; and Gazdecki, Frank J., 4,312,793, Cl. 252-513.000.
Gebauer, Gerhard, to J. Wagner GmbH, Firma. Pressure peak compensator for pulsating streams of liquid. 4,312,382, Cl. 138-30.000.
Gelbwachs, Jerry A. Ultrasensitive trace element analyzer. 4,313,057, Cl. 250-458.000.
Gemini Systems, Inc.: *See—*
Skow, Lynn R., 4,312,321, Cl. 126-99.00A.
General Body Company: *See—*
Hoyerman, William H., 4,312,416, Cl. 177-50.000.
General Electric Company: *See—*
Bock, Donald D.; and Hedel, Kurt K., 4,313,155, Cl. 363-21.000.
Brown, Harold, 4,313,167, Cl. 364-431.020.
Chovan, Joseph L., 4,313,185, Cl. 367-149.000.
Clendenin, William H., 4,312,212, Cl. 73-15.400.
Darolia, Ramgopal, 4,312,599, Cl. 403-29.000.
Markezich, Ronald L.; Freimiller, Gary L.; Olander, Walter K.; and Axelrod, Robert J., 4,312,803, Cl. 260-45.7PH.
Molari, Richard E., Jr., 4,312,903, Cl. 428-34.000.
Nash, Dudley O.; and Knight, Glenn L., Jr., 4,312,185, Cl. 60-739.000.
Rathje, William C., 4,313,076, Cl. 318-790.000.
Staats, James E., 4,313,044, Cl. 219-10.55D.
Tye, Gene, 4,312,262, Cl. 89-41.0EA.
White, James A.; and Rice, Frank L., 4,313,043, Cl. 219-10.55R.
General Instrument Corporation: *See—*
Lipsky, Stephen E., 4,313,117, Cl. 343-119.000.
General Motors Corporation: *See—*
Arnold, John W.; and Mills, Steven L., 4,312,820, Cl. 264-40.100.
Chraplyvy, Andrew R.; Croat, John J.; and Herbst, Jan F., 4,312,684, Cl. 148-121.000.
Reider, Samuel B., 4,312,186, Cl. 60-754.000.
Witherspoon, Romeo R.; and Meibuhr, Stuart G., 4,312,931, Cl. 429-229.000.
Yu, Ruey J.; and Berg, Morris, 4,312,770, Cl. 252-514.000.
General Supply (Constructions) Co. Ltd.: *See—*
Pelekis, Emmanouil A., 4,312,629, Cl. 418-191.000.
Geochem Research, Inc.: *See—*
Carlisle, Charles T., 4,312,635, Cl. 23-230.00R.
Geraci, Donald C.: *See—*
Taylor, Harry M.; Braaten, Terry L.; Stephens, Jack E.; and Geraci, Donald C., 4,312,424, Cl. 184-6.400.
Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,312,254, Cl. 83-177.000.

Gergely, Alex S., to Philip Morris, Inc. Fibrous rod forming device. 4,312,698, Cl. 156-441.000.

Gerkin, Richard M.: *See—*
Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., 4,312,973, Cl. 528-75.000.

Gestestner Limited: *See—*
Gates, Albert G. R., 4,312,270, Cl. 101-122.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Temme, Helmut, 4,312,442, Cl. 198-561.000.

Gheewala, Tushar R., to International Business Machines Corporation. Direct coupled nonlinear injection Josephson logic circuits. 4,313,066, Cl. 307-462.000.

Gibbs, Ralph H.; and Stuemky, Robert E., to Gates Rubber Company, The. Torque transfer device for flexible shaft couplings. 4,312,193, Cl. 64-9.00R.

Gilbert, Barrie; and Holloway, Peter R., to Analog Devices, Incorporated. Temperature compensated IC voltage reference. 4,313,083, Cl. 323-350.000.

Gilbert, Patrick: *See—*
Beaudoin, Paul; Gilbert, Patrick; and Petres, Jacques, 4,312,216, Cl. 73-54.000.

Gillette, Robert H., to Brammall, Inc. Screw tube lock. 4,312,529, Cl. 292-315.000.

Giron, David J.: *See—*
Carraher, Charles E., Jr.; Giron, David J.; Schroeder, Jack A.; and McNeely, Christy A., 4,312,981, Cl. 536-84.000.

Gitchel, Wayne B., to Zimpro-AEC Ltd., 01 Kerr; Richard K. Calgary CAX. Treatment of clay slimes. 4,312,761, Cl. 210-747.000.

Givaudan Corporation: *See—*
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., 4,313,007, Cl. 568-376.000.

Glassman, Jacob A. Surgical mask. 4,312,338, Cl. 128-201.120.

Globe Tool and Engineering Company, The: *See—*
Finegold, Hyman B., 4,312,387, Cl. 140-92.200.

Gluckman, Melvyn I., to American Home Products Corporation. Prevention of gastric ulcers and depression of gastric secretion by administration of guanabenz. 4,312,886, Cl. 424-326.000.

Godley, Fred O., Sr. Newspaper vending machine. 4,312,461, Cl. 221-195.000.

Goebel, James C.: *See—*
Jacobs, William, III; and Goebel, James C., 4,312,988, Cl. 544-196.000.

Goineau, Andre M.: *See—*
Kluger, Edward W.; and Goineau, Andre M., 4,313,004, Cl. 564-491.000.

Gold, Elijah H.; and Chang, Wei, to Schering Corporation. Treatment of glaucoma. 4,312,863, Cl. 424-230.000.

Goldade, Sebastian M. Log-joint system. 4,312,161, Cl. 52-233.000.

Golicz, Roman M.; Gunther, William H., Jr.; and Hough, James W., to G.B.R., Ltd. Mechanism for making an envelope around an insert. 4,312,169, Cl. 53-206.000.

Goodyear Tire & Rubber Company, The: *See—*
Baus, Andre E. J., 4,312,395, Cl. 152-209.00R.

Goossens, Bernhard: *See—*
Kuster, Erich; Goossens, Bernhard; Dahmen, Kurt; and Barthell, Eduard, 4,312,998, Cl. 564-205.000.

Gordon, Richard S.: *See—*
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., 4,312,665, Cl. 71-113.000.

Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, to EVG Entwicklungs -u. Verwertungs-Gesellschaft m.b.H. Change-under-load transmission. 4,312,243, Cl. 74-346.000.

Gozdziewicz, Zygmunt: *See—*
Przybyla, Janusz; Haczek, Leopold; Gozdziewicz, Zygmunt; Szal, Andrzej; Pieczyk, Jozef; and Maczynski, Andrzej, 4,312,207, Cl. 72-100.000.

Graef, Harry T.; Mercer, Scott A.; and Hill, Jeffrey A., to Diebold Incorporated. Remote depository with sealed deposit container construction. 4,312,277, Cl. 109-24.100.

Graham Magnetics, Inc.: *See—*
Armstrong, Harris W., 4,312,896, Cl. 427-96.000.
McDaniel, Gordon L., 4,312,898, Cl. 427-130.000.

Grand, Paul S., to Colgate-Palmolive Company. Compositions containing aminopolyureylene resin. 4,312,855, Cl. 424-59.000.

Granda, Edward J.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,312,888, Cl. 426-3.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,312,766, Cl. 252-8.900.

Grant, R. M. Golf putter. 4,312,509, Cl. 273-167.00A.

Great Lakes Carbon Corporation: *See—*
Hsu, Harry L.; Grindstaff, Lloyd I.; and Whittaker, Mack P., 4,312,745, Cl. 208-125.000.
Shea, Frederick L., Jr., 4,312,763, Cl. 210-777.000.

Green, Dennis C., to International Business Machines Corporation. Substituted heterofulvalenes. 4,312,992, Cl. 549-59.000.

Green, Richard L. Coupon organizer. 4,312,393, Cl. 150-39.000.

Greene, Larry D., to Acco Industries Inc. Loader-unloader system for work pieces. 4,312,618, Cl. 414-225.000.

Greimel, Rudolf: *See—*
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, 4,312,139, Cl. 34-54.000.

Gretag Aktiengesellschaft: *See—*
Widmer, Walter R., 4,313,031, Cl. 178-22.170.

Griffin, Freddie, Jr.: *See—*
Wilson, David A.; Crump, Druce K.; and Griffin, Freddie, Jr., 4,312,815, Cl. 260-429.900.

Griffiths, James E.: *See—*
Degenkolb, Eugene O.; Griffiths, James E.; and Mogab, Cyril J., 4,312,732, Cl. 204-192.00E.

Grigg, Charles E. Expandable ashtray. 4,312,346, Cl. 128-242.000.

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Hale, Arthur H. Binocular reflecting telescope. 4,312,560, Cl. 350-27.000.
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Hansen, Elmer K. Overload tool mounting assembly for soil tilling implement. 4,312,408, Cl. 172-267.000.
Hansen, Manfred, to Sack GmbH. Method for operating a strip rolling mill. 4,312,209, Cl. 72-237.000.
Hansson, Hasse A.; and Kagedal, Sven L., to Pharmacia Fine Chemicals, AB. Medium for isoelectric focusing. 4,312,739, Cl. 204-299.00R.
Hara, Hajime; Kaiya, Atsushi; and Araki, Yoshihiko, to Nippon Oil Co., Ltd. Method for producing low molecular weight polymer. 4,313,019, Cl. 585-429.000.
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Harbaugh, Steven K., to Eocom Corporation. Optical scanner and system for laser beam exposure of photo surfaces. 4,312,590, Cl. 355-51.000.
Hardin, Dick K.; and Puttlitz, Frederic J., to International Business Machines Corporation. Shared storage for multiple processor systems. 4,313,161, Cl. 364-200.000.
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Harper, Jon J., to Standard Oil Company (Indiana). Membrane separation of catalyst metals from aromatic acid production. 4,312,778, Cl. 252-410.000.
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Hartman, Robert L.; Koszi, Louis A.; and Schumaker, Norman E., to Bell Telephone Laboratories, Incorporated. Light emitting semiconductor devices. 4,313,125, Cl. 357-17.000.
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Hermann, Jean; and Bourgeois, Claude, to Centre Electronique Horloger S.A. Piezo-electric quartz resonator. 4,313,071, Cl. 310-361.000.
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Hough, James W.: *See—*
Golicz, Roman M.; Gunther, William H., Jr.; and Hough, James W., 4,312,169, Cl. 53-206.000.

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Flickinger, William T.; and Staiger, Donald W., 4,312,828, Cl. 264-349.000.

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Reimann, William G., 4,312,897, Cl. 427-96.000.
Su, Stephen C.; and Finnila, Ronald M., 4,313,127, Cl. 357-30.000.
Walker, Donald F.; and Phelps, Robert G., 4,313,033, Cl. 179-1.00H.

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Hunt, Keith, to Eastman Kodak Company. Disperse dyes from heterocyclic acetonitriles. 4,312,985, Cl. 542-457.000.

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IBG International, Inc.: *See—*
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Ibrahim, Fayez F.; and Perez, Arthur, to Tyler Refrigeration Corporation. Glass door merchandiser with heat trap. 4,312,190, Cl. 62-255.000.

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ICI Americas Inc.: *See—*
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Brannan, Robert C.; Markham, Harvey R.; and Nilsson, Ben A., 4,312,589, Cl. 355-14.0CH.
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Heimeier, Helmut H.; Klein, Wilfried; Najmann, Knut; and Wernicke, Friedrich C., 4,313,179, Cl. 365-189.000.
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International Power Technology, Inc.: *See—*
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Interpace Corporation: *See—*
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Invironments Inc.: *See*—
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Iowa State University Research Foundation, Inc.: *See*—
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IRD Mechanalysis, Inc.: *See*—
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Itoh, Hiroshi; Honda, Tadatoshi; Saitoh, Jun; and Mitsuishi, Takatoshi, to Mitsui Toatsu Chemicals Incorporated. Process for purifying aqueous acrylamide solutions. 4,313,001, Cl. 564-206.000.
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Jackson, Kenneth E., to Jahabow Industries, Inc. Revolving display case. 4,312,550, Cl. 312-268.000.
Jackson, Lynden A., to Post Office, The. Dielectric optical waveguide cables. 4,312,566, Cl. 350-96.230.
Jacobs, John J.; and Kuhn, Gerhard, to Carrier Corporation. Suspension and seal system for a refrigeration motor compressor. 4,312,627, Cl. 417-363.000.
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Janssen, Jozef T. A., to U.S. Philips Corporation. Patient support. 4,312,500, Cl. 269-324.000.
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Jarcho, Michael; and Rossetti, Michael, to Sterling Drug Inc. Ceramic forming process. 4,312,821, Cl. 264-43.000.
Jardin, Hans; Schatzler, Walter; and Sielk, Werner, to Webasto-Werk W. Baier GmbH and Co. Sliding roof for motor vehicles. 4,312,533, Cl. 296-214.000.
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Pollitt, John M.; and Hill, Dennis M., 4,312,078, Cl. 2-424.000.
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Kerber, George L., to United States of America, Navy. Linearized multiplier device for triple product convolvers. 4,313,175, Cl. 364-844.000.
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Van Auken, Charles L., 4,312,607, Cl. 406-128.000.

Khanna, Som N., to Uniroyal Ltd. Interpolymers of polyurethanes and addition polymerizable monomers. 4,312,972, Cl. 528-63.000.

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Kierstead, Richard W.: *See—*
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Kinderman, John. Apparatus for the display of goods. 4,312,449, Cl. 206-466.000.

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Borgersen, Roland; and Mullen, James G., 4,312,220, Cl. 73-81.000.

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Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.

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Klein, Richard W., Sr. Method for cleaning clogged pipes. 4,312,679, Cl. 134-8.000.

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Klink, Erich: *See—*
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Klioze, Solomon S.; and Ehrgott, Frederick J., to Hoechst-Roussel Pharmaceuticals Incorporated. Antidepressive and analgesic 4-aryloxy- and 4-arylthio-3-phenylpiperidines. 4,312,876, Cl. 424-267.000.

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Knab, James V. Toxic fume absorber. 4,312,291, Cl. 118-50.000.

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Koch, Christopher E., to Exploration Logging, Inc. Carrier system for positioning sensors adjacent a wire rope. 4,312,223, Cl. 73-151.000.

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Kokusai Denshin Denwa Co., Ltd.: *See—*
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Komatsu, Fumito; Nakata, Kazuhiko; Sinozaki, Junichiro; Kazama, Eiichi; and Morishige, Hiroshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Dot printing apparatus. 4,312,269, Cl. 101-93.040.

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Kondo, Tsuneyuki; Miwa, Kishio; and Inoue, Takehisa, to Toray Industries Incorporated. Process for the separation of cyclohexene. 4,313,014, Cl. 585-827.000.

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Koon, Homer E., Jr., to Alpha Arms, Inc. Rifle barrel and receiver mounting means for rifle stock. 4,312,146, Cl. 42-75.00C.

Koon, Tan C. Umbrellas. 4,312,371, Cl. 135-19.500.

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Korduner, Hans M.; Gyllang, Hans E.; and Ericson, Kjell Y., to AB Pripps Bryggerier. Beverage product. 4,312,856, Cl. 424-145.000.

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Koszi, Louis A.: *See—*
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Kramer, Dennis M.; and Dock, John C., to Chrysler Corporation. Knock detector for internal combustion engine. 4,312,214, Cl. 73-35.000.

Kramer, Raymond A., to Aluminum Company of America. Phosphorous removal in silicon purification. 4,312,849, Cl. 423-348.000.

Kraska, Allen R., to Pfizer Inc. 1-(2-Hydroxy-3-n-alkoxypropyl)-4-substituted piperidines, pharmaceutical compositions, thereof and use thereof. 4,312,877, Cl. 424-267.000.

Krause, Hans P.: *See*—
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Kreusel, Ulrich. Heat-damming compound profile. 4,312,905, Cl. 428-122.000.

Krumm, Charles F.; and Pucel, Robert A., to Raytheon Company. Field effect transistor. 4,313,126, Cl. 357-22.000.

Kruse, Walter M.; and Stephen, John F., to ICI Americas Inc. Process for preparing 5-(2-chloro-4-trifluoromethylphenoxy)-2-nitro-N-alkanesulphonyl benzamides from a toluene derivative and intermediates. 4,313,000, Cl. 564-99.000.

Kubota, Hitoshi, to Nissan Motor Company, Limited. Control device for a vehicle hydraulic braking system. 4,312,543, Cl. 303-24.00R.

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Kulwin, Richard. Double tier automotive ski rack. 4,312,467, Cl. 224-315.000.

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Kurtz, Leonard D.; and Bidwell, Robert E. Drainage device with separate outflow chamber. 4,312,351, Cl. 128-276.000.

Kuster, Erich; Goossens, Bernhard; Dahmen, Kurt; and Barthell, Eduard, to Chemische Fabrik. Method for making N-substituted acrylamides. 4,312,998, Cl. 564-205.000.

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Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Coke car for a battery of coke ovens. 4,312,712, Cl. 202-229.000.

La Gard Lock, Inc.: *See*—
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LaFontaine, Pierre, to SEB S.A. Portable water purifier especially for domestic use. 4,312,754, Cl. 210-267.000.

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Lefevre, Joseph D., to Dow Chemical Co., The. Electrolytic cell and process for electrolytic oxidation. 4,312,720, Cl. 204-78.000.

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Hagedorn, Floyd T.; and Revells, Robert G., 4,312,661, Cl. 65-290.000.

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Lo, Gerald J. P.; Nowland, Wayne L.; and Shelton, Anthony N., to Northern Telecom Limited. Circuit and method for reducing polarization crosstalk caused by rainfall. 4,313,220, Cl. 455-304.000.

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Logie, James A., to Exxon Research & Engineering Co. Carrier recovery circuit for a facsimile system. 4,313,139, Cl. 358-281.000.

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Lu, Chin H., to Xerox Corporation. Method of imaging using nitrogen-containing additives for magnetic toners. 4,312,933, Cl. 430-122.000.

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Lundgren, Lars. Mop heads. 4,312,092, Cl. 15-119.00A.

Lyckesjo, Ralph O., to AB Volvo. Electrical connection device. 4,312,553, Cl. 339-60.00M.

Lynn International Inc.: *See*—
Morrow, John T., 4,312,404, Cl. 166-84.000.

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Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, to Macedo, Pedro B.; and Litovitz, Theodore A. Immobilization of radwastes in glass containers and products formed thereby. 4,312,774, Cl. 252-629.000.

MacNitt, Donald G., Jr.; and Walker, Bryant H., to United Technologies Corporation. Forging method and apparatus. 4,312,211, Cl. 72-354.000.

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Magera, Matthias. Refractory insulation for cooling pipes in reheating furnaces. 4,312,385, Cl. 138-149.000.

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Maitre, Xavier C.; and Thomas, Alain M. Transmission system of frequency division multiplex signals on digital links. 4,313,194, Cl. 370-69.000.

Malik, Richard J. Aquarium filter apparatus. 4,312,752, Cl. 210-169.000.

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Markezich, Ronald L.; Freimiller, Gary L.; Olander, Walter K.; and Axelrod, Robert J., to General Electric Company. Thermally stable polycarbonate compositions. 4,312,803, Cl. 260-45.7PH.

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Martini, Richard M., to Carrier Corporation. Part load calculator. 4,313,054, Cl. 235-78.00R.

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Mascolo, Anthony; and Helrigel, Albert, to Grumman Aerospace Corporation. Pipe fitting. 4,312,551, Cl. 339-14.00R.

Massachusetts Institute of Technology: *See—*
Fan, John C. C., 4,312,915, Cl. 428-323.000.
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Matsuda, Noboru, to Duskin Franchise Co., Ltd. Viscous liquid soap composition. 4,312,771, Cl. 252-107.000.

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Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, to Ciba-Geigy Corporation. Process for producing triarylphosphites. 4,312,818, Cl. 260-976.000.

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Maxemchuk, Nicholas F., to Bell Telephone Laboratories, Incorporated. Spread spectrum arrangement for (de)multiplexing speech signals and nonspeech signals. 4,313,197, Cl. 370-111.000.

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Baker, William B.; and May, Joe T., 4,312,593, Cl. 356-414.000.

Mayer, Georg; Schroter, Horst; and Laux, Helmut, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Coke oven gas extraction equipment. 4,312,713, Cl. 202-263.000.

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Mayer, Joseph; Peer, Lydia; and Babad, Esther, to Schering Corporation. Benzodiazepine intermediates. 4,312,996, Cl. 564-92.000.

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Mazzocchi, Gabriele, to Societa Italiana Telecomunicazioni Siemens S.p.A. Synchronous demultiplexer with elastic bit store for TDM/PCM telecommunication system. 4,313,198, Cl. 370-112.000.

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McCole, Thomas P., to Polaroid Corporation. Photographic product and process of making the same. 4,312,939, Cl. 430-497.000.

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McGuffin, William G., to RCA Corporation. Stylus position sensor for video disc player apparatus. 4,313,189, Cl. 369-220.000.

McHerron, James I., to Calocerinos & Spina. Airport lighting sequence control. 4,313,063, Cl. 307-135.000.

McIlvried, Howard G., III: *See—*
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McIntyre, John M.; and Caldwell, Donald L., to Dow Chemical Company, The. Corrosion resistant electrolytic cell. 4,312,723, Cl. 204-98.000.

McKinney, Maurice E., to Boeing Company, The. Variable camber trailing edge for airfoil. 4,312,486, Cl. 244-215.000.

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McNeely, Christy A.: *See—*
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Burt, Arthur D., 4,312,610, Cl. 408-26.000.
Waller, Campbell E.; and Watts, Keith E., 4,312,616, Cl. 411-387.000.

McVeen, Milford D., to Towmotor Corporation. Chain anchoring arrangement. 4,312,426, Cl. 187-9.00E.

McWhorter, Edward M. Engine vertical ventillation. 4,312,313, Cl. 123-433.000.

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McWilliams, Rose M. Method and apparatus for enumerative display and disposal of surgical sponges. 4,312,447, Cl. 206-370.000.

Mead, John F., to Plessey Handel und Investments A.G. Optical fibre switches. 4,312,561, Cl. 350-96.210.

Mead, John F., to Plessey Handel und Investments A.G. Connectors for sealed containers. 4,312,563, Cl. 350-96.200.

Medney, Jonas. Reinforced pole. 4,312,162, Cl. 52-309.160.

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Medtronic, Inc.: *See*—
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Meier, Klaus: *See*—
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Meisch, Charles E.; and Baker, Robert N., to C. R. Bard, Inc. Hanger, hook and handle assembly for urinary drainage bag. 4,312,352, Cl. 128-294.000.
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Meisner, David J., to Garrett Corporation, The. Inflatable flow control. 4,312,484, Cl. 244-17.170.
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Melsheimer, Stephen T., to Design & Funding, Inc. Liquid carrier concentrate for pre-loaded cup. 4,312,889, Cl. 426-86.000.
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Menth, Anton; Muller, Rene; and Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Electrolysis cell for water dissolution. 4,312,736, Cl. 204-255.000.
Mercer, Scott A.: *See*—
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Meyer, Adolf, to Heidelberger Zement AG. Fast-hardening hydraulic cement mass and surfacing method using the mass. 4,312,904, Cl. 428-36.000.
Meywald, Klaus; and Ohnmacht, Helmut, to Fritz Eichenauer, Firma. Electrical heating element for fluid media. 4,313,049, Cl. 219-375.000.
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Mikhail, Ezzat A., to Minnesota Mining and Manufacturing Company. Cyclicacylaminoperfluoroalkanesulfonanilides and derivatives thereof. 4,312,663, Cl. 71-88.000.
Mikulla, Klaus D., to Linde Aktiengesellschaft. Separation system. 4,312,652, Cl. 62-29.000.
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Miller, Keith E.: *See*—
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Miller, Robert C., to Hughes Helicopters, Inc. Radiation shielding and gas diffusion apparatus. 4,312,480, Cl. 239-127.300.
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Mills, Franky D., to Hamby Company, The. Rotary hoe implement. 4,312,409, Cl. 172-551.000.
Mills, Harry N.; and Jasinski, John, to Owens-Illinois, Inc. Olive-green glass compositions. 4,312,953, Cl. 501-71.000.
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Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetraalkyl-4-piperidyl alcohol esters of tetradecylene polycarboxylic acids as light stabilizers for synthetic polymers. 4,312,804, Cl. 260-45.8NZ.
Minami, Toshihiro: *See*—
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Miyagawa, Fumihiro; and Takahashi, Akira, to Ricoh Company, Ltd. Film frame number display for camera. 4,312,581, Cl. 354-106.000.
Miyazawa, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear fuel rod. 4,312,707, Cl. 376-450.000.
Mizoguchi, Toshimi: *See*—
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Mizusawa, Akira, to Nifco, Inc. Bracket for head of panel fastener. 4,312,165, Cl. 52-511.000.
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Mo och Domsjo Aktiebolag: *See*—
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Mochizuki, Daisuke; and Kitano, Shigeru, to Sharp Kabushiki Kaisha. Refresh system for a dynamic memory. 4,313,180, Cl. 365-222.000.
Mock, Donald E., to Anjac Plastics, Inc. Wall assemblies. 4,312,166, Cl. 52-522.000.
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Monty, Henri; Querido, Robert; and Benkwitt, Frances C., to Stauffer Chemical Company. Dicalcium phosphate dihydrate having improved monofluorophosphate compatibility and process for the preparation thereof. 4,312,843, Cl. 423-267.000.
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Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Hirano, Toru; and Sato, Hideki, to Toyo Seikan Kaisha, Ltd. Process for making closure caps having liners. 4,312,824, Cl. 264-135.000.
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Morrow, John T., to Lynn International Inc. Rotating blowout preventer. 4,312,404, Cl. 166-84.000.
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Grube, Franklin F., Jr., 4,313,025, Cl. 174-50.000.
Hume, Edward F.; and Hand, Steven C., 4,313,210, Cl. 455-117.000.
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Mullins, Harvey L. Mobile lawn rake attachment. 4,312,095, Cl. 56-400.140.
Munny, Gunter. Prosthetic joints for crural amputees. 4,312,081, Cl. 3-22.000.
Munoz, Antonio S. Brace for thorax fractures. 4,312,334, Cl. 128-78.000.
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Murase, Heihachi; and Yamamoto, Tutomu, to Kansai Paint Co., Ltd. Coating composition capable of forming a multilayer film. 4,312,902, Cl. 427-386.000.
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Murphy, John P.; and Kuderna, Jerry G., to Shell Oil Company. Dispensing apparatus for toilets. 4,312,082, Cl. 4-228.000.
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Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Granda, Edward J.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Derivatives of cis-3-hexenol and process for producing compositions of matter containing cis-3-hexenal and products produced thereby and organoleptic uses thereof. 4,312,766, Cl. 252-8.900.
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Nakamura, Taku; and Nagatomo, Shigeru, to Fuji Photo Film Co., Ltd. Photographic material containing a novel polymer mordant. 4,312,940, Cl. 430-510.000.
Nakanishi, Kiyoshi; and Okumura, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Helically-shaped intake port of an internal combustion engine. 4,312,309, Cl. 123-188.00M.
Nakanishi, Kuninosuke: *See—*
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Nakano, Tokutaka; Sakata, Takao; Iwama, Masamichi; and Isago, Takao, to Fujitsu Limited; and Kokusai Denshin Denwa Co., Ltd. Time division multiplex transmission apparatus. 4,313,193, Cl. 370-43.000.

Nakao, Kiyoshi: *See—*
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Nakata, Kazuhiko: *See—*
Komatsu, Fumito; Nakata, Kazuhiko; Sinozaki, Junichiro; Kazama, Eiichi; and Morishige, Hiroshi, 4,312,269, Cl. 101-93.040.

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Aketa, Kohichi; Suzuki, Yukio; Ohno, Nobuo; Nakayama, Isamu; and Kato, Takashi, 4,312,816, Cl. 260-465.00D.

Nakayama, Masahito: *See—*
Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, 4,312,858, Cl. 424-181.000.

Nakayama, Yasuharu: *See—*
Aihara, Tetsuo; Nakayama, Yasuharu; Nakanishi, Kuninosuke; Yamashita, Yoshio; and Toyomoto, Isao, 4,312,797, Cl. 260-23.0AR.

Nakazima, Masao: *See—*
Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, 4,312,795, Cl. 260-18.00R.

Nakhle, George D.; and Bell, Cecil R., Jr., to Consolidated Foods Corporation. Trap gate valve assembly. 4,312,608, Cl. 406-171.000.

Nalco Chemical Company: *See—*
Kekish, George T.; and Kugel, Roger W., 4,312,901, Cl. 427-236.000.

Nardozza, Vincent J.; and Clinch, Marvin R., to United States of America, Air Force. Method and system for selectively disrupting radio telegraph communications. 4,313,207, Cl. 455-1.000.

Nash, Dudley O.; and Knight, Glenn L., Jr., to General Electric Company. Low profile fuel injection system. 4,312,185, Cl. 60-739.000.

Nassry, Assadullah; Maxwell, Jerrold F.; Compton, John W.; Panek, Edward J.; and Davis, Pauls, to BASF Wyandotte Corporation. Synergistic polyether thickeners for water-based hydraulic fluids. 4,312,768, Cl. 252-32.70E.

National Petro Chemicals Corp.: *See—*
Katzen, Stanley J.; and Rekers, Louis J., 4,312,786, Cl. 252-430.000.

National Semiconductor Corporation: *See—*
Burns, Carmen D., 4,312,926, Cl. 428-571.000.

National-Standard Company: *See—*
Bryant, Emerson C., 4,312,696, Cl. 156-415.000.
Colucci, Stephen L., 4,312,670, Cl. 75-200.000.

National Starch and Chemical Corporation: *See—*
Chiao, Wen B., 4,312,974, Cl. 528-114.000.

National Union Electric Corporation: *See—*
Schaefer, Harold W., 4,312,542, Cl. 300-21.000.

Nauchen Institute po Ortopedia i Travmatologia: *See—*
Hau, Antonin; and Pechacek, Ctirad, 4,312,249, Cl. 74-866.000.

Neely, James E., Jr., to PPG Industries, Inc. Mixed alkali silicate compositions for coatings and cements. 4,312,673, Cl. 106-74.000.

Neely, James E., Jr.; Falleroni, Charlene A.; Moff, Annette; and Lin, Chia-Cheng, to PPG Industries, Inc. Trimetaphosphate compounds of trivalent metals. 4,312,844, Cl. 423-314.000.

Neely, James W.: *See—*
Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., 4,312,956, Cl. 521-28.000.

Negele, Richard; and Birkenmaier, Wilhelm, to SKF Kugellagerfabriken GmbH. Seal for bearings. 4,312,547, Cl. 308-187.100.

Nei, Hiromichi: *See—*
Ninomiya, Susumu; Ohtsuka, Fumio; Nei, Hiromichi; Harata, Mituo; Takikawa, Osamu; and Imai, Atsuo, 4,312,733, Cl. 204-195.00S.

Neidorff, Robert A., to Motorola, Inc. Positive temperature coefficient current source and applications. 4,313,082, Cl. 323-312.000.

Nelson, David E.; and Bouyoucos, John V., to Hydroacoustics, Inc. Optical transducer array system. 4,313,192, Cl. 370-4.000.

Nelson, Robert C., to Mining Machinery Development Corp. Belt conveyor tandem drive assembly with ground level clean-out clearance. 4,312,445, Cl. 198-835.000.

Nelson, Wayne F.: *See—*
McLaurin, Charles H.; and Nelson, Wayne F., 4,312,406, Cl. 166-386.000.

Neuhold, Heimo, to Reinhold Hinteregger Maschinen- und Seilbahnbau. Ropeway crane. 4,312,456, Cl. 212-96.000.

Neville, Roy G. Method for the removal of free and complex cyanides from water. 4,312,760, Cl. 210-724.000.

Newell, Elizabeth L.: *See—*
Ort, Morris R.; and Newell, Elizabeth L., 4,312,960, Cl. 521-182.000.

Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Flame retardant antistatic additives and antistatic fibers. 4,312,966, Cl. 525-425.000.

Nichols, Michael F., to University of Missouri, The Curators of the. Ion-selective electrode. 4,312,734, Cl. 204-195.00G.

Nicholson, James E.; and Milesky, Lawrence, to Codman and Shurtleff, Inc. Pressure monitoring system for electrofluidic sensing devices. 4,312,361, Cl. 128-748.000.

Nickell, Louis G.: *See—*
Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., 4,312,665, Cl. 71-113.000.

Niemoller, Gerhard; Stromberg, Wilfried; and Schneider, Friedhelm, to Becker-Prunte GmbH; and Stahlhammer Bommern Gebr. Schneider. Scraper for chains in chain conveyors, particularly for use underground. 4,312,443, Cl. 198-731.000.

Nifco Inc.: *See—*
Kimura, Shigeru, 4,312,487, Cl. 248-73.000.
Mizusawa, Akira, 4,312,165, Cl. 52-511.000.

Nihara, Koichi: *See—*
Hirai, Toshio; and Nihara, Koichi, 4,312,923, Cl. 428-446.000.

Niigata Engineering Co., Ltd.: *See—*
Kado, Tetsuro, 4,312,143, Cl. 37-43.00R.

Niihara, Koichi: *See—*
Hirai, Toshio; and Niihara, Koichi, 4,312,921, Cl. 428-446.000.
Hirai, Toshio; and Niihara, Koichi, 4,312,924, Cl. 428-446.000.

Niiro, Yasuhiko: *See—*
Wakabayashi, Hiroharu; and Niiro, Yasuhiko, 4,313,224, Cl. 455-601.000.

Nijboer, Sjoerd: *See—*
Kraakman, Hillebrand J. J.; Broeksema, Egbert; and Nijboer, Sjoerd, 4,312,823, Cl. 264-107.000.

Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. Connecting circuit for a telephone line. 4,313,034, Cl. 179-16.00F.

Nilson, Nils B., to Kenova AB. Syringe. 4,312,344, Cl. 128-216.000.

Nilssen, Albert G.; and Hermanson, Spencer L., to Wescom, Inc. DTMF Signal receiver. 4,313,038, Cl. 179-84.0VF.

Nilsson, Ben A.: *See—*
Brannan, Robert C.; Markham, Harvey R.; and Nilsson, Ben A., 4,312,589, Cl. 355-14.0CH.

Nilsson, Rune. Feeding apparatus. 4,312,469, Cl. 226-150.000.

Ninomiya, Susumu; Ohtsuka, Fumio; Nei, Hiromichi; Harata, Mituo; Takikawa, Osamu; and Imai, Atsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Unit for measuring alkali metal vapor concentration. 4,312,733, Cl. 204-195.00S.

Nippon Electric Co., Ltd.: *See—*
Hosokawa, Masashi; Sanada, Kei; and Kawamura, Takuro, 4,313,084, Cl. 323-370.000.
Mori, Toshihiro, 4,313,107, Cl. 340-825.710.
Nomura, Tadashi; Inada, Hiroshi; Morita, Keizo; Watanabe, Akio; and Nishikawa, Kiyoaki, 4,313,074, Cl. 318-608.000.
Sakamoto, Kazuo; and Hayasaka, Takeshi, 4,313,223, Cl. 455-323.000.

Nippon Infrared Industries Co., Ltd.: *See—*
Suenaga, Norihiro; Sugiyama, Seiji; and Suenaga, Nobuyuki, 4,313,093, Cl. 331-94.50D.

Nippon Kogaku K.K.: *See—*
Araki, Yoshitaka, 4,312,579, Cl. 354-29.000.
Yamada, Masaoki; Onogi, Kenji; and Ito, Ryozo, 4,312,945, Cl. 435-26.000.

Nippon Koshuha Steel Co. Ltd.: *See—*
Nishizawa, Masatoshi; Minami, Toshihiro; Nakahara, Takeshi; and Hasegawa, Toyofumi, 4,312,210, Cl. 72-267.000.

Nippon Oil Co., Ltd.: *See—*
Hara, Hajime; Kaiya, Atsushi; and Araki, Yoshihiko, 4,313,019, Cl. 585-429.000.

Nippon Steel Corporation: *See—*
Kawashima, Katsuhiro; Murota, Shoji; Nakamori, Yukio; and Suzuki, Hisao, 4,312,231, Cl. 73-643.000.

Nippon Zeon Co., Ltd.: *See—*
Kobayashi, Toshiaki; Takeuchi, Teruo; and Nakamura, Mamoru, 4,312,796, Cl. 260-23.0XA.

Nippondenso Co., Ltd.: *See—*
Esaki, Hisao; and Uchida, Yoshiro, 4,312,651, Cl. 55-502.000.

Nishihara, Hiroshi: *See—*
Segawa, Hideo; Koyama, Jiro; Nishihara, Hiroshi; and Masuda, Masamitsu, 4,312,562, Cl. 350-96.150.

Nishikawa, Kiyoaki: *See—*
Nomura, Tadashi; Inada, Hiroshi; Morita, Keizo; Watanabe, Akio; and Nishikawa, Kiyoaki, 4,313,074, Cl. 318-608.000.

Nishina, Masamitu: *See—*
Yanagida, Seiichi; Takeuchi, Hisaharu; and Nishina, Masamitu, 4,313,141, Cl. 360-78.000.

Nishiura, Junji, to Takeda Riken Kogyo Kabushikikaisha. Logic test system permitting test pattern changes without dummy cycles. 4,313,200, Cl. 371-25.000.

Nishiyama, Noboru: *See—*
Agusa, Kazuo; and Nishiyama, Noboru, 4,313,045, Cl. 219-74.000.

Nishizawa, Masatoshi; Minami, Toshihiro; Nakahara, Takeshi; and Hasegawa, Toyofumi, to Kobe Steel Limited; and Nippon Koshuha Steel Co. Ltd. Warm forging method for cup-shaped pieces. 4,312,210, Cl. 72-267.000.

Nissan Motor Co., Ltd.: *See—*
Aoyama, Shunichi, 4,312,494, Cl. 251-48.000.
Iwata, Hiroyoshi, 4,312,311, Cl. 123-339.000.
Kubota, Hitoshi, 4,312,543, Cl. 303-24.00R.
Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, 4,312,795, Cl. 260-18.00R.
Takase, Sadao, 4,312,315, Cl. 123-479.000.

Niwa, Koichi: *See—*
Yamada, Seiichi; Kamehara, Nobuo; Hashimoto, Kaoru; Yokoyama, Hiromitsu; Niwa, Koichi; and Murakawa, Kyohei, 4,313,026, Cl. 174-68.500.

Noddings, John, to Associated Engineering Limited. Electrical override arrangements, for example for vehicle speed control systems. 4,312,419, Cl. 180-177.000.

Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Two-stroke cycle gasoline engine. 4,312,305, Cl. 123-51.0BA.
Nomura, Tadashi; Inada, Hiroshi; Morita, Keizo; Watanabe, Akio; and Nishikawa, Kiyoaki, to Nippon Electric Co., Ltd. Servo control system operable on digital basis. 4,313,074, Cl. 318-608.000.
Norcros Investments Limited: *See*—
Brown, Arthur; and Murray, Kevin F., 4,312,711, Cl. 202-227.000.
Norminton, Robert S., to Fleet Industries. Compact cross shaft type compound drum hoist for spooling extra long lengths of tow cable with segmented fairings. 4,312,496, Cl. 254-302.000.
North American Utility Construction Corp.: *See*—
Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, 4,312,709, Cl. 202-83.000.
Northern Telecom Limited: *See*—
Chu, Pak-Jong, 4,313,150, Cl. 361-399.000.
Lo, Gerald J. P.; Nowland, Wayne L.; and Shelton, Anthony N., 4,313,220, Cl. 455-304.000.
Norwood, Donald D.; and Watts, Jackie C., to Phillips Petroleum Co. Polymerization catalyst and process. 4,312,967, Cl. 526-64.000.
Norz, Wolfgang, to Union Special G.m.b.H. Stitch shortening and tacking assembly for blindstitch sewing machines. 4,312,290, Cl. 112-178.000.
Noth, Richard W.: *See*—
Moser, Floyd R.; and Noth, Richard W., 4,312,116, Cl. 29-588.000.
Nowland, Wayne L.: *See*—
Lo, Gerald J. P.; Nowland, Wayne L.; and Shelton, Anthony N., 4,313,220, Cl. 455-304.000.
Nunnemacher, Hermann A.; and Weil, Peter, Jr., to Galland Henning Nopak Inc. Fluid pressure operated cylinder assembly. 4,312,264, Cl. 92-161.000.
Nunokawa, Hisao: *See*—
Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, 4,312,795, Cl. 260-18.00R.
Nurk, Siegfried, to Sipra Patententwicklungs u. Beteiligungsgesellschaft mbH, Firma. Dust-collecting system for circular knitting machine. 4,312,195, Cl. 66-168.000.
Nussdorfer, Theodore J.: *See*—
Ross, Don H.; and Nussdorfer, Theodore J., 4,312,324, Cl. 126-418.000.
Oak Industries Inc.: *See*—
Doles, Glenn P.; and Beran, James J., 4,313,132, Cl. 358-114.000.
Obayashi, Tsutomu: *See*—
Hiraoka, Yoshiji; and Obayashi, Tsutomu, 4,312,907, Cl. 428-212.000.
Oblonsky, Jan G., to International Business Machines Corp. Priority system with low speed request bus. 4,313,196, Cl. 370-85.000.
O'Donnell, John J., Jr.; and Hutchinson, Kenneth S., to Motorola, Inc. Extended AGC for a radio receiver. 4,313,218, Cl. 455-239.000.
Oehr, Klaus H., to B.C. Research Council. Electrolytic oxidation process. 4,312,721, Cl. 204-78.000.
Oestreich, Ulrich; and Zeidler, Guenter, to Siemens Aktiengesellschaft. Gas pressure tight optical cables. 4,312,565, Cl. 350-96.230.
Oetiker, Hans. Hose clamp with insert member. 4,312,101, Cl. 24-20.00R.
Ogawa, Hiroshi: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.
Ogawa, Toshiko: *See*—
Otsu, Takatoshi; Tanaka, Yasunobu; Fukushima, Osamu; Mituhashi, Takeshi; Mizuno, Tadatune; Ogawa, Toshiko; and Ichikawa, Kazuo, 4,312,585, Cl. 354-321.000.
Ogilvy, James J.: *See*—
Jullien, Graham A., 4,312,511, Cl. 273-237.000.
O'Hanlon, Peter J.: *See*—
Rogers, Norman H.; and O'Hanlon, Peter J., 4,312,867, Cl. 424-248.500.
O'Hara, Mark F.: *See*—
Voges, Kenneth; Schoenbeck, Elroy A.; O'Hara, Mark F.; and Schmitt, Thomas E., 4,312,325, Cl. 126-423.000.
Ohashi, Shigeo. Small switch. 4,313,041, Cl. 200-6.00R.
Ohki, Hiroshi: *See*—
Kojima, Chiaki; Ohki, Hiroshi; and Hasegawa, Kayoko, 4,312,559, Cl. 350-3.720.
Ohlsson, Bjorn: *See*—
Andersson, Torsten; and Ohlsson, Bjorn, 4,312,357, Cl. 128-664.000.
Ohniwa, Takehiko; and Sugiura, Yoji, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Electromagnetically driven shutter device. 4,312,583, Cl. 354-234.000.
Ohnmacht, Helmut: *See*—
Meywald, Klaus; and Ohnmacht, Helmut, 4,313,049, Cl. 219-375.000.
Ohno, Nobuo: *See*—
Aketa, Kohichi; Suzuki, Yukio; Ohno, Nobuo; Nakayama, Isamu; and Kato, Takashi, 4,312,816, Cl. 260-465.00D.
Ohta, Tomohisa: *See*—
Kakumaru, Hajime; Hayashi, Nobuyuki; Ishimaru, Toshiaki; Nakao, Kiyoshi; and Ohta, Tomohisa, 4,312,916, Cl. 428-345.000.
Ohtani, Kuniji, to Izumi Motor Co., Ltd. Shock absorber. 4,312,430, Cl. 188-377.000.
Ohtani, Masami, to Dainippon Screen Manufacturing Co., Ltd. Method and apparatus for the development of films in a photographic film processor. 4,312,586, Cl. 354-321.000.
Ohtsuka, Fumio: *See*—
Ninomiya, Susumu; Ohtsuka, Fumio; Nei, Hiromichi; Harata, Mituo; Takikawa, Osamu; and Imai, Atsuo, 4,312,733, Cl. 204-195.00S.
Okuda, Tsunehito. Thumbtack tacker. 4,312,472, Cl. 227-113.000.
Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,312,309, Cl. 123-188.00M.
Olander, Walter K.: *See*—
Markezich, Ronald L.; Freimiller, Gary L.; Olander, Walter K.; and Axelrod, Robert J., 4,312,803, Cl. 260-45.7PH.
Oldham, Ronald C.; and Worthington, Peter, to International Standard Electric Corporation. Cable termination securement. 4,313,028, Cl. 174-70.00S.
Olin Corporation: *See*—
Caule, Elmer J., 4,312,922, Cl. 428-446.000.
Chandalia, Kiran B.; and Barnowski, Henry G., 4,312,963, Cl. 525-56.000.
Kircher, Morton S., 4,312,737, Cl. 204-257.000.
Olivieri, Roberto; Viglia, Aurelio; Degen, Ludwig; Angelini, Leonello; and Fascetti, Eugenio, to Snamprogetti S.p.A. Enzymic microbiological process for producing optically active aminoacids starting from hydantoins and/or racemic carbamoyl derivatives. 4,312,948, Cl. 435-253.000.
Olsen, Gary E. Trailer hitch. 4,312,516, Cl. 280-406.00A.
Olsen, Theodore A. Useful device such as a cutting implement for suspending from a key ring or the like. 4,312,128, Cl. 30-157.000.
Olson, Theodore A., to Life Care Systems, Inc. Noninvasive blood pressure measuring system. 4,312,359, Cl. 128-680.000.
Olympus Optical Co., Ltd.: *See*—
Kamachi, Shinichi; and Fujiwara, Toshihide, 4,312,728, Cl. 204-180.00S.
Kimura, Kenji, 4,313,136, Cl. 358-153.000.
Yamashita, Nobuo; and Maeda, Miwako, 4,312,572, Cl. 350-423.000.
Omori, Akira: *See*—
Seki, Masao; Sato, Hideo; Kawata, Takashi; Omori, Akira; and Abe, Hidekazu, 4,312,650, Cl. 55-459.00B.
Onogi, Kenji: *See*—
Yamada, Masaoki; Onogi, Kenji; and Ito, Ryozo, 4,312,945, Cl. 435-26.000.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,312,875, Cl. 424-266.000.
Optische Werke G. Rodenstock: *See*—
Wilms, Karl-Heinz, 4,312,574, Cl. 351-7.000.
Orenstein, Henry. Controllable response systems. 4,312,151, Cl. 46-240.000.
Ort, Morris R.; and Newell, Elizabeth L., to Monsanto Company. Foam crystallization of condensation polymers. 4,312,960, Cl. 521-182.000.
Orthofix S.r.l.: *See*—
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, 4,312,336, Cl. 128-92.00A.
O'Sullivan, James P., to Sperry Limited. Collision avoidance apparatus. 4,313,115, Cl. 343-5.0EM.
Otis Engineering Corporation: *See*—
Dollison, William W., 4,312,378, Cl. 137-625.440.
Otsu, Takatoshi; Tanaka, Yasunobu; Fukushima, Osamu; Mituhashi, Takeshi; Mizuno, Tadatune; Ogawa, Toshiko; and Ichikawa, Kazuo, to Fuji Photo Film Co., Ltd. Method and apparatus for treating graphic arts process photosensitive materials. 4,312,585, Cl. 354-321.000.
Otto, Eberhard: *See*—
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,312,818, Cl. 260-976.000.
Outboard Marine Corporation: *See*—
McChesney, Richard M.; and DuBois, Chester G., 4,312,314, Cl. 123-438.000.
Ovalstrapping, Inc.: *See*—
Pasic, James A., 4,312,266, Cl. 100-7.000.
Overman, John W.: *See*—
Wells, Thomas R.; and Overman, John W., 4,312,578, Cl. 353-79.000.
Owens-Corning Fiberglas Corporation: *See*—
Canfield, Sheldon A.; and Sanik, Paul S., 4,312,657, Cl. 65-29.000.
Mayer, James R., 4,312,658, Cl. 65-29.000.
Stalego, Joseph P.; and Lawson, Ernest E., 4,312,674, Cl. 106-105.000.
Owens-Illinois, Inc.: *See*—
Brummett, Marshall G., 4,312,697, Cl. 156-423.000.
Mills, Harry N.; and Jasinski, John, 4,312,953, Cl. 501-71.000.
Panarello, Salvatore C.; and Schmitzler, Edward G., 4,312,659, Cl. 65-84.000.
Oy Partek AB: *See*—
Carbol, Vlastimil, 4,312,952, Cl. 501-36.000.
Ozols, Karlis V. Force-responsive device. 4,312,227, Cl. 73-516.0LM.
P. A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen GmbH & Co., KG: *See*—
Lindenberg, Wilhelm, 4,312,537, Cl. 297-317.000.
PA Incorporated: *See*—
Jennings, Charles E., 4,312,320, Cl. 126-79.000.

Pack, Ernest A., to BHF Engineering Limited. Disposal of waste glass. 4,312,655, Cl. 65-28.000.

PACO Packaging Incorporated: *See—*
Haines, Russell R., 4,312,523, Cl. 283-18.000.

Paetzold, William F. Bag holder for collapsible bags. 4,312,489, Cl. 248-97.000.

Page, Derrick J.: *See—*
Schlegel, Earl S.; and Page, Derrick J., 4,313,128, Cl. 357-79.000.

Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,312,875, Cl. 424-266.000.

Page, Peter B.: *See—*
Ananthan, Manickam; Herring, William J.; Williams, Thomas D.; and Page, Peter B., 4,313,105, Cl. 340-825.560.

Pall Corporation: *See—*
Verrando, Marcel G., 4,312,640, Cl. 55-33.000.
Verrando, Marcel G.; and White, Donald H., Jr., 4,312,641, Cl. 55-33.000.

Palmer, John P.; Piper, Alfred E. C.; and Harris, Richard J., to ITW Limited. Security fastener. 4,312,614, Cl. 411-44.000.

Palmer, Patrick V.: *See—*
Mannion, Geoffrey; and Palmer, Patrick V., 4,312,668, Cl. 75-130.00R.

Panarello, Salvatore C.; and Schmitzler, Edward G., to Owens-Illinois, Inc. Air support system for glass tubing alley. 4,312,659, Cl. 65-84.000.

Panek, Edward J.; and Davis, Pauls, to BASF Wyandotte Corporation. Polyether thickeners for aqueous systems containing additives for increased thickening efficiency. 4,312,775, Cl. 252-316.000.

Panek, Edward J.: *See—*
Nassry, Assadullah; Maxwell, Jerrold F.; Compton, John W.; Panek, Edward J.; and Davis, Pauls, 4,312,768, Cl. 252-32.70E.

Papp, Alfred: *See—*
Schneider, Hartmut; and Papp, Alfred, 4,312,653, Cl. 65-3.120.

Papp, Roger; and Mongenet, Francois, to Produits Chimiques Ugine-Kuhlmann. Hydroformylation loop reactors. 4,312,837, Cl. 422-224.000.

Parish, Harlie A., Jr.: *See—*
Purcell, William P.; and Parish, Harlie A., Jr., 4,312,862, Cl. 424-228.000.

Park, Arthur, to Diamond Oil Well Drilling Company. Method and apparatus for obtaining saturation data from subterranean formations. 4,312,414, Cl. 175-59.000.

Park, Hun S., to Hyo-San Industries Co., Ltd. Battery powered electronic guitar. 4,312,258, Cl. 84-1.160.

Park, Robert H., to Battery Development Corporation. Method of charge control for vehicle hybrid drive batteries. 4,313,080, Cl. 320-61.000.

Parker-Hannifin Corporation: *See—*
Tilling, Basil B.; and Swindler, Henry A., 4,312,373, Cl. 137-393.000.

Parkinson, William R.; Swift, Thomas R.; and Ivanick, Paul F., to Lockheed Corporation. Door seal. 4,312,153, Cl. 49-485.000.

Parmatic Filter Corporation: *See—*
Mavros, Stratos; and Wright, Dennis, 4,312,645, Cl. 55-213.000.

Parshall, David G., to AMSTED Industries Incorporated. Filtration system with bi-flow filter. 4,312,764, Cl. 210-790.000.

Pasic, James A., to Ovalstrapping, Inc. Object-turning apparatus for a high-speed strapping machine. 4,312,266, Cl. 100-7.000.

Passaglia, Arcangelo: *See—*
Busacca, Guido; Meli, Vincenzo; Passaglia, Arcangelo; and Sanfilippo, Michele, 4,313,091, Cl. 331-90.000.

Pastorini, Giovanni: *See—*
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.

Pastva, John V., Jr.; and Pelcin, Albert L., to Eastern Company, The. Paddle lock with bolt-carried handle disconnect member. 4,312,202, Cl. 70-472.000.

Patel, Vishnubhai V.: *See—*
Engler, Edward M.; Patel, Vishnubhai V.; and Schumaker, Robert R., 4,312,991, Cl. 549-39.000.

Paul Hettich & Co.: *See—*
Sundermeier, Gunter, 4,312,098, Cl. 16-240.000.

Paul, William A. Support for trailer tip outs. 4,312,159, Cl. 52-67.000.

Pav-Saver Mfg. Co.: *See—*
Dale, Charles H., 4,312,602, Cl. 404-100.000.

Pearce, Henry A.; Voytik, Paul; and Walsh, Edward J., to Electric Power Research Institute, Inc. Ultra pure tetrachloroethylene dielectric fluid. 4,312,794, Cl. 252-581.000.

Pearl, David R., to Gerber Garment Technology, Inc. Fluid jet apparatus for cutting sheet material. 4,312,254, Cl. 83-177.000.

Pechacek, Ctirad: *See—*
Hau, Antonin; and Pechacek, Ctirad, 4,312,249, Cl. 74-866.000.

Peck, Anthony S.: *See—*
Hall, John L.; and Peck, Anthony S., 4,312,528, Cl. 292-92.000.

Peer, Lydia: *See—*
Mayer, Joseph; Peer, Lydia; and Babad, Esther, 4,312,996, Cl. 564-92.000.

Peiser, Adolf E.; and Latzko, Richard I., to Colt Industries Operating Corp. Tool changer for vertical spindle machine. 4,312,111, Cl. 29-568.000.

Pelcin, Albert L.: *See—*
Pastva, John V., Jr.; and Pelcin, Albert L., 4,312,202, Cl. 70-472.000.

Pelekis, Emmanouil A., to General Supply (Constructions) Co. Ltd. Universal rotating machine for expanding or compressing a compressible fluid. 4,312,629, Cl. 418-191.000.

Pelster, James J., to Eltra Corporation. Station wire box with insert. 4,312,448, Cl. 206-409.000.

Pennington, Donald A.: *See—*
Arnold, Charles R.; and Pennington, Donald A., 4,312,906, Cl. 428-204.000.

Pennwalt Corporation: *See—*
Hager, Robert B., 4,313,006, Cl. 568-70.000.

Pepera, Marc A.: *See—*
Dolhyj, Serge R.; and Pepera, Marc A., 4,312,787, Cl. 252-435.000.

Perez, Arthur: *See—*
Ibrahim, Fayez F.; and Perez, Arthur, 4,312,190, Cl. 62-255.000.

Perucchi, Norberto; and Mock, Elmar, to Eta A.G. Ebauches-Fabrik. Method of manufacturing stators for stepping motors. 4,312,119, Cl. 29-596.000.

Pesa, Frederick A.; and Haase, Thomas A., to Standard Oil Company. Process for the separation of catalyst from products obtained in the hydrocarboxylation of unsaturated nitriles. 4,312,781, Cl. 252-414.000.

Petersen, Erwin: *See—*
Rode, Konrad; Petersen, Erwin; and Lindemann, Klaus, 4,313,166, Cl. 364-426.000.

Petersen, Uwe; Metzger, Karl G.; Zeiler, Hans-Joachim; Stadler, Peter; and Voss, Eckart, to Bayer Aktiengesellschaft. Sisomicin derivatives, processes for their production and their medicinal use. 4,312,859, Cl. 424-180.000.

Petersson, Bengt O., to Bengt Petersson New Products Investment AB. Method of fastening buttons and the like to a textile material and an apparatus for practising such method. 4,312,077, Cl. 2-265.000.

Petres, Jacques: *See—*
Beaudoin, Paul; Gilbert, Patrick; and Petres, Jacques, 4,312,216, Cl. 73-54.000.

Petro-Tex Chemical Corporation: *See—*
Manning, Harold E., 4,313,016, Cl. 585-832.000.

Petrolite Corporation: *See—*
Becker, Harold L.; Buriks, Rudolf S.; and Dolan, James G., 4,312,969, Cl. 526-206.000.
Quinlan, Patrick M., 4,312,830, Cl. 422-12.000.
Quinlan, Patrick M., 4,312,831, Cl. 422-12.000.
Quinlan, Patrick M., 4,312,832, Cl. 422-12.000.

Peyman, Gholam A.; Koziol, Jeffrey E.; and Yasuda, Hirotsugu. Soft corneal contact lens with tightly cross-linked polymer coating and method of making same. 4,312,575, Cl. 351-160.00H.

Pfizer Inc.: *See—*
Kraska, Allen R., 4,312,877, Cl. 424-267.000.

Pharmacia Fine Chemicals, AB: *See—*
Hansson, Hasse A.; and Kagedal, Sven L., 4,312,739, Cl. 204-299.00R.

Phelps, Robert G.: *See—*
Walker, Donald F.; and Phelps, Robert G., 4,313,033, Cl. 179-1.00H.

Philip Morris, Inc.: *See—*
Gergely, Alex S., 4,312,698, Cl. 156-441.000.
Houminer, Yoram; and Grubbs, Harvey J., 4,312,368, Cl. 131-277.000.
Mullen, Thomas W., III; Hultz, Richard M.; and Turner, Thomas O., 4,312,369, Cl. 131-290.000.
Seeman, Jeffrey I., 4,312,367, Cl. 131-276.000.

Phillips, Edward J. Fender guide. 4,313,104, Cl. 340-102.000.

Phillips Petroleum Co.: *See—*
Dietz, Richard E., 4,312,968, Cl. 526-125.000.
Harris, Jesse R., 4,313,013, Cl. 585-818.000.
McGinnis, Roger N.; Gardner, Lloyd E.; and Farha, Floyd, Jr., 4,313,017, Cl. 585-266.000.
Norwood, Donald D.; and Watts, Jackie C., 4,312,967, Cl. 526-64.000.
Welch, M. Bruce, 4,312,784, Cl. 252-429.00B.

Phillips, Robert B.: *See—*
Knight, Lindsay C.; Curtis, Anthony T.; Phillips, Robert B.; and Bowyer, William H., 4,313,182, Cl. 367-117.000.

Phoenix Aktiengesellschaft: *See—*
Thorns, Joachim; Meier, Klaus; and Jordan, Klaus, 4,312,394, Cl. 152-353.00R.

Photon Power, Inc.: *See—*
Jordan, John F.; and Lampkin, Curtis M., 4,313,022, Cl. 136-244.000.

Pickens, Patrick A.; Lindroth, Thomas A.; and Carico, Robert D., to Merck & Co., Inc. High concentration polymer slurries. 4,312,675, Cl. 106-171.000.

Pickett, David A.: *See—*
Thomas, Rudy V.; Pickett, David A.; and Harrell, Terry R., 4,312,521, Cl. 280-806.000.

Piduch, Hans-Gunter: *See—*
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,312,712, Cl. 202-229.000.

Pieczyk, Jozef: *See—*
Przybyla, Janusz; Haczek, Leopold; Gozdziewicz, Zygmunt; Szal, Andrzej; Pieczyk, Jozef; and Maczynski, Andrzej, 4,312,207, Cl. 72-100.000.

Pierce, William S.; and Donachy, James H., to United States of America, Health & Human Services. Polymer alloy blood compatible surface. 4,312,920, Cl. 428-425.500.

Pierron, Claude, to A. Raymond. Clamp for securing articles of round cross section. 4,312,488, Cl. 248-74.00R.

Piesche, Gunter: *See*—
Leiber, Heinz; and Piesche, Gunter, 4,312,380, Cl. 137-627.500.
Pillow, Dan L., to Dresser Industries, Inc. Fluid operated rock drill hammer. 4,312,412, Cl. 173-17.000.
Pinaire, Lonnie W., to United States of America, Air Force. Hydrogen cooled turbine. 4,312,625, Cl. 416-96.00R.
Pinheiro, Victor: *See*—
Baumans, Hans W.; Tuck, Julian S. W.; Ahmad, Mohammad; Le Dinh, Chon T.; and Pinheiro, Victor, 4,313,172, Cl. 364-563.000.
Pinter, Reinhard: *See*—
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, 4,312,139, Cl. 34-54.000.
Pioch, Peter P., to Black & Decker Inc. Sound absorption for a lawnmower. 4,312,421, Cl. 181-202.000.
Pioneer Electronic Corporation: *See*—
Fukushima, Jun, 4,313,133, Cl. 358-118.000.
Sato, Reisuke, 4,313,090, Cl. 330-149.000.
Piper, Alfred E. C.: *See*—
Palmer, John P.; Piper, Alfred E. C.; and Harris, Richard J., 4,312,614, Cl. 411-44.000.
Pitney Bowes Inc.: *See*—
Tolmie, Robert J., Jr., 4,312,468, Cl. 226-9.000.
Pitzele, Barnett S.: *See*—
Lambert, Howard J.; and Pitzele, Barnett S., 4,312,806, Cl. 260-149.000.
Pizzuti, Donato F.; and Triggs, Charles W., to Polaroid Corporation. Exposure control and focusing apparatus for use in a photographic camera. 4,312,582, Cl. 354-196.000.
PLC Engineering Company Limited: *See*—
Hall, John L.; and Peck, Anthony S., 4,312,528, Cl. 292-92.000.
Plessey Handel und Investments AG: *See*—
Jarman, Leonard B.; and Allan, Keith M., 4,313,184, Cl. 367-88.000.
Plessey Handel und Investments A.G.: *See*—
Mead, John F., 4,312,561, Cl. 350-96.210.
Mead, John F., 4,312,563, Cl. 350-96.200.
Plischke, LeMoyne W.; and Kiefer, Joseph M., to Monsanto Company. Electrochemical process for incorporating copper in nylon. 4,312,719, Cl. 204-72.000.
Plonski, Edward. Dispensing device for coffee and the like. 4,312,390, Cl. 141-380.000.
Pohlmann, Erich, to ASK August Schneider GmbH & Co. KG. Bivalent heating system. 4,312,476, Cl. 237-2.00B.
Polaroid Corporation: *See*—
McCole, Thomas P., 4,312,939, Cl. 430-497.000.
Pizzuti, Donato F.; and Triggs, Charles W., 4,312,582, Cl. 354-196.000.
Pollitt, John M.; and Hill, Dennis M., to Kangol Helmets Limited. Helmet with pivotable visor. 4,312,078, Cl. 2-424.000.
Porro, Francesco; Gabriele, Cosimo; and Hotz, Walter, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Scanning electron microscope with a chamber which can be broken down, particularly for observing pieces of relatively large dimensions. 4,313,056, Cl. 250-442.000.
Porta Systems Corp.: *See*—
De Luca, Paul V.; and Rawlings, David, 4,313,039, Cl. 179-98.000.
Porter, Ernest E.: *See*—
Smith, Marnell; Katvala, Victor W.; and Porter, Ernest E., 4,312,292, Cl. 118-320.000.
Porter Instrument Co., Inc.: *See*—
Thompson, James W., Sr., 4,312,339, Cl. 128-205.250.
Porter, Marion G.; and Ryan, Charles P., to Honeywell Information Systems Inc. Cache apparatus for enabling overlap of instruction fetch operations. 4,313,158, Cl. 364-200.000.
Portionmat (Engineering) Limited: *See*—
Faulkner, Keith; and Appleford, David E., 4,312,462, Cl. 222-56.000.
Posso, Patrick. Drawer unit for storing cases normally containing magnetic tape cassettes. 4,312,548, Cl. 312-9.000.
Post Office, The: *See*—
Jackson, Lynden A., 4,312,566, Cl. 350-96.230.
Potter, Bronson M. Sanitary waste disposal packets. 4,312,085, Cl. 4-661.000.
Powell, Norman F.; Lee, Henry E.; and Guillen, Francisco J., to Westinghouse Electric Corp. Hybrid adaptive sidelobe canceling system. 4,313,116, Cl. 343-100.0LE.
PPG Industries, Inc.: *See*—
Neely, James E., Jr., 4,312,673, Cl. 106-74.000.
Neely, James E., Jr.; Falleroni, Charlene A.; Moff, Annette; and Lin, Chia-Cheng, 4,312,844, Cl. 423-314.000.
Welch, Cletus N., 4,312,738, Cl. 204-282.000.
Pratt, Charles E., to Chattem, Inc. Continuous process for grease preparation. 4,312,769, Cl. 252-35.000.
Praudisch, Ernst: *See*—
Mayer, Hubert; and Praudisch, Ernst, 4,312,141, Cl. 36-117.000.
Predina, Joseph P., to Motorola, Inc. Precision quadrature analog phase detector. 4,313,089, Cl. 328-155.000.
Preisler, Erich; Bilek, Karl; Pinter, Reinhard; Greimel, Rudolf; Weinmann, Milada; Holik, Herbert; and Feurstein, Guntram, to Escher Wyss GmbH. Material web drier. 4,312,139, Cl. 34-54.000.
Price, Michael C.: *See*—
Weil, Thomas A.; Dzadzic, Peter M.; Shih, Chien-Cheng J.; and Price, Michael C., 4,313,011, Cl. 585-240.000.
Procter & Gamble Company, The: *See*—
Amneus, John S., 4,312,689, Cl. 156-160.000.
Productronix, Inc.: *See*—
Budraitis, Tadas, 4,312,241, Cl. 73-862.350.
Produits Ballu-Schuiling S.A.: *See*—
Williame, Paul H. R., 4,312,671, Cl. 106-38.200.
Produits Chimiques Ugine-Kuhlmann: *See*—
Papp, Roger; and Mongenet, Francois, 4,312,837, Cl. 422-224.000.
Prussner, Peter: *See*—
Dorre, Erhard; Prussner, Peter; and Zichner, Ludwig, 4,312,079, Cl. 3-1.913.
Przybyla. Janusz; Haczek, Leopold; Gozdziewicz, Zygmunt; Szal, Andrzej; Pieczyk, Jozef; and Maczynski, Andrzej, to Zaklad Doswiadczalny Przy Zakladach Urzadzen Chemiczynch "Metalchem". Rolling mill for forming cross ribbed pipes. 4,312,207, Cl. 72-100.000.
Pucel, Robert A.: *See*—
Krumm, Charles F.; and Pucel, Robert A., 4,313,126, Cl. 357-22.000.
Puls, Walter: *See*—
Junge, Bodo; Muller, Lutz; Sitt, Rudiger; Thomas, Gunter; Krause, Hans P.; and Puls, Walter, 4,312,872, Cl. 424-267.000.
Purcell, William P.; and Parish, Harlie A., Jr., to Debiopharm SA. Therapeutically active derivatives of benzamide. 4,312,862, Cl. 424-228.000.
Puri, Rishi R.; and Collington, Kenneth T., to FBC Limited. Blowing agent compositions. 4,312,776, Cl. 252-350.000.
Purrer, Josef: *See*—
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,312,177, Cl. 56-208.000.
Puttlitz, Frederic J.: *See*—
Hardin, Dick K.; and Puttlitz, Frederic J., 4,313,161, Cl. 364-200.000.
Pye (Electronic Products) Limited: *See*—
Morgan, John T., 4,312,557, Cl. 339-130.00R.
Quanbeck, Sherman H.; Ringdahl, Albert O.; and Desautels, David P., to Wil-Rich, Inc. Auger for filling seeder on tool bar carrier. 4,312,621, Cl. 414-523.000.
Quartz, William L.: *See*—
Kasper, Klaus B.; Quartz, William L.; and Myers, William H., 4,312,937, Cl. 430-496.000.
Quast, Kenneth J.: *See*—
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,312,934, Cl. 430-294.000.
Querido, Robert: *See*—
Monty, Henri; Querido, Robert; and Benkwitt, Frances C., 4,312,843, Cl. 423-267.000.
Quibel, Jacques: *See*—
Lhonore, Pierre; Quibel, Jacques; and Jacquinot, Bernard, 4,313,009, Cl. 568-947.000.
Lhonore, Pierre; Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, 4,313,010, Cl. 568-948.000.
Quick, Michael H., to UOP Inc. Recovery of catalysts. 4,312,779, Cl. 252-411.00R.
Quinlan, Patrick M., to Petrolite Corporation. Tertiary amino-substituted thiazines. 4,312,830, Cl. 422-12.000.
Quinlan, Patrick M., to Petrolite Corporation. Quaternaries of tertiary amino-substituted thiazines. 4,312,831, Cl. 422-12.000.
Quinlan, Patrick M., to Petrolite Corporation. Polymerization of aromatic nitrogen heterocyclic compounds. 4,312,832, Cl. 422-12.000.
Quinn, Edward B.: *See*—
Allred, James K.; and Quinn, Edward B., 4,312,623, Cl. 414-786.000.
Raab, Hans. Window cleaning device. 4,312,093, Cl. 15-121.000.
Racal Communications Inc.: *See*—
Whitlock, Ward P., 4,313,212, Cl. 455-146.000.
Rademaker, Pieter D.: *See*—
Tolley, William K.; and Rademaker, Pieter D., 4,312,841, Cl. 423-150.000.
Raimann, Gerhard: *See*—
Schwomma, Otto; Raimann, Gerhard; and Breit, Hans P., 4,312,580, Cl. 354-64.000.
Raisin, Jean-Pierre: *See*—
Doyen, Joel; and Raisin, Jean-Pierre, 4,312,281, Cl. 112-121.110.
Raksis, Joseph W.: *See*—
Jachimowicz, Felek; and Raksis, Joseph W., 4,312,965, Cl. 525-378.000.
Ralston, Richard W.: *See*—
Stern, Ernest R.; and Ralston, Richard W., 4,313,178, Cl. 365-183.000.
Randin, Jean-Paul, to Ebauches S.A. Polymeric electrolyte for electro-optical device. 4,312,929, Cl. 429-188.000.
Randolph, Arthur J. Foot powered tufting machine. 4,312,471, Cl. 227-15.000.
Rathje, William C., to General Electric Company. Dynamoelectric machine, method of operating such, and circuit. 4,313,076, Cl. 318-790.000.
Ratner, David A., to Aladdin Heating Corporation. Air flow damping system. 4,312,381, Cl. 137-636.000.
Ravenelle, Lucien. Mounting arrangement for a sewing machine. 4,312,549, Cl. 312-21.000.
Rawlings, David: *See*—
De Luca, Paul V.; and Rawlings, David, 4,313,039, Cl. 179-98.000.
Rawlins, Philip G.: *See*—
Livingston, Ralph H.; and Rawlins, Philip G., 4,312,617, Cl. 414-121.000.
Ray, Richard C.: *See*—
Fickenscher, Hermann; Hock, Richard H.; Ray, Richard C.; and Scuderi, Rudolph, 4,313,060, Cl. 307-23.000.
Raychem Corporation: *See*—
Ganzhorn, Harry E., 4,312,571, Cl. 350-320.000.

Tweed, Donald G., 4,312,121, Cl. 29-611.000.

Raynor, Robert H.: *See—*
Jewett, Bryce D.; Raynor, Robert H.; and Adams, Robert P., 4,312,317, Cl. 123-522.000.

Raytheon Company: *See—*
Krumm, Charles F.; and Pucel, Robert A., 4,313,126, Cl. 357-22.000.
Robillard, David R.; and Michals, Robert L., 4,312,117, Cl. 29-589.000.

RCA Corporation: *See—*
Bartolini, Robert A.; Burke, William J.; and Bloom, Allen, 4,313,188, Cl. 369-109.000.
Bilsky, Herbert W.; and Callen, Patrick J., 4,313,078, Cl. 320-15.000.
Hsu, Sheng T., 4,312,680, Cl. 148-1.500.
Hsu, Sheng T., 4,313,106, Cl. 340-825.910.
McGuffin, William G., 4,313,189, Cl. 369-220.000.
Rustman, James C.; and Mindel, Michael J., 4,313,134, Cl. 358-728.500.
Wilber, James A.; and Christopher, Todd J, 4,313,062, Cl. 307-108.000.
Yost, Thomas D., 4,313,130, Cl. 358-21.00R.

Reber, Walter. Device to facilitate pedestrian locomotion. 4,312,140, Cl. 36-3.00B.

Red Bud Industries, Inc.: *See—*
Voges, Kenneth; Schoenbeck, Elroy A.; O'Hara, Mark F.; and Schmitt, Thomas E., 4,312,325, Cl. 126-423.000.

Reda, Kazimierz; Cann, Roald; and Ambrose, Lawrence A., to Bryant Grinder Corporation. Apparatus for grinding grooves in the inner race of a constant velocity universal joint. 4,312,155, Cl. 51-105.00R.

Redmond, Donald E., Jr., to Boehringer Ingelheim International GmbH. Method of eliminating opiate withdrawal symptoms with clonidine in humans. 4,312,878, Cl. 424-273.00R.

Reed, James A.; and Davis, Edwin W., to Eastern Company, The. Paddle lock with rotatably-mounted handle disconnect member. 4,312,205, Cl. 70-472.000.

Refreshment Machinery Incorporated: *See—*
Stewart, William G.; and Lawhon, David, 4,313,075, Cl. 318-722.000.

Regar, Karl N., to Man Maschinenfabrik Augsburg-Nurnberg AG. Exhaust gas turbocharger for diesel engines. 4,312,183, Cl. 60-608.000.

Regat, Charles Y., deceased (by Ibarra, Rolande Annette Blanche, legal representative), to Schlumberger Limited. Method of generating subsurface characteristic models. 4,313,164, Cl. 364-422.000.

Regie Nationale des Usines Renault: *See—*
Carrion, Jean-Pierre; and Le Buhan, Christian, 4,312,197, Cl. 70-135.000.

Regnier, Gilbert; and Bure, Jacques, to Science Union et Cie. Monosubstituted piperazines. 4,312,869, Cl. 424-250.000.

Reichert, Klaus: *See—*
Blaurock, Gunter; Albert, Ernst; Reichert, Klaus; and Schlereth, Rudolf, 4,312,545, Cl. 308-6.00C.

Reider, Samuel B., to General Motors Corporation. Shingled laminated porous material. 4,312,186, Cl. 60-754.000.

Reif, Robert B.; and Albrechtson, Loren R., to Battelle Development Corporation. Detecting particles. 4,312,180, Cl. 60-39.09R.

Reiff, Evan J. Drafting instrument. 4,312,130, Cl. 33-18.00R.

Reil, Wilhelm, to Tetra Pak Development S.A. Opening means for packaging containers. 4,312,450, Cl. 206-605.000.

Reimann, William G., to Hughes Aircraft Company. Buried resist technique for the fabrication of printed wiring. 4,312,897, Cl. 427-96.000.

Reimers, Stephen D.; and Wischhoefer, Larry L., to Reimers, Stephen D. Flow rate meter correction apparatus. 4,312,233, Cl. 73-861.010.

Reinhold Hinteregger Maschinen- und Seilbahnbau: *See—*
Neuhold, Heimo, 4,312,456, Cl. 212-96.000.

Rekers, Louis J.: *See—*
Katzen, Stanley J.; and Rekers, Louis J., 4,312,786, Cl. 252-430.000.

Remo, Inc.: *See—*
Henrit, Robert J., 4,312,259, Cl. 84-411.00A.

Renzi Brivio, Lodovico: *See—*
Danieletto, Giuseppina; De Bastiani, Giovanni; Faccioli, Giovanni; Renzi Brivio, Lodovico; Aldegheri, Roberto; and Cavazzana, Andrea, 4,312,336, Cl. 128-92.00A.

Republic Steel Corporation: *See—*
Bricker, John K.; and Mandula, Joseph M., Jr., 4,312,230, Cl. 73-638.000.

Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: *See—*
Hirai, Toshio; and Niihara, Koichi, 4,312,921, Cl. 428-446.000.
Hirai, Toshio; and Nihara, Koichi, 4,312,923, Cl. 428-446.000.
Hirai, Toshio; and Niihara, Koichi, 4,312,924, Cl. 428-446.000.

Reuter, Gerhard: *See—*
Serbent, Harry; Reuter, Gerhard; Schnabel, Wolfram; and Eichberger, Heinz, 4,312,666, Cl. 75-11.000.

Revells, Robert G.: *See—*
Hagedorn, Floyd T.; and Revells, Robert G., 4,312,661, Cl. 65-290.000.

Rey, Thomas J. Electro-acoustic flowmeter. 4,312,238, Cl. 73-861.280.

Reynolds Metals Company: *See—*
Dewey, John L., 4,312,852, Cl. 423-393.000.

Rheaume, Walter A., to Textile Products Incorporated. Heat conductive fabric. 4,312,913, Cl. 428-257.000.

Rhodes, E.; and Scott, D. S., to Alberta Oil Sands Technology and Research Authority. Two-phase flowmeter. 4,312,234, Cl. 73-861.040.

Rhodes, Smith A., to Communications Satellite Corporation. Carrier synchronization and symbol synchronization for offset-QPSK burst communications. 4,313,205, Cl. 375-86.000.

Rhone-Poulenc-Textile: *See—*
Morieras, Gilbert, 4,312,260, Cl. 87-1.000.

Ricca, Anthony: *See—*
Brodis, Eric P.; and Ricca, Anthony, 4,312,688, Cl. 156-63.000.

Rice, Frank L.: *See—*
White, James A.; and Rice, Frank L., 4,313,043, Cl. 219-10.55R.

Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., to Bard Laboratories, Inc. Photosensitive compositions. 4,312,934, Cl. 430-294.000.

Richardson-Merrell Inc.: *See—*
Lal, Harbans, 4,312,879, Cl. 424-273.00R.

Richter, Detlev; and Zimmermann, Robert, to U.S. Philips Corporation. Automatic exposure control device for an X-ray generator. 4,313,055, Cl. 250-322.000.

Ricoh Co., Ltd.: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,313,123, Cl. 346-75.000.
Kanda, Hajime; and Hirose, Takesada, 4,313,138, Cl. 358-280.000.
Miyagawa, Fumihiro; and Takahashi, Akira, 4,312,581, Cl. 354-106.000.
Segawa, Hideo; Koyama, Jiro; Nishihara, Hiroshi; and Masuda, Masamitsu, 4,312,562, Cl. 350-96.150.

Riedl, Volker, to Audi Nsu Auto Union Aktiengesellschaft. Surface hardening of cams of motor-vehicle camshafts. 4,312,685, Cl. 148-146.000.

Riley, John G.: *See—*
Smith, Norman; Riley, John G.; Huff, Edward R.; and Worcester, Dwight C., 4,317,278, Cl. 110-234.000.

Ringdahl, Albert O.: *See—*
Quanbeck, Sherman H.; Ringdahl, Albert O.; and Desautels, David P., 4,312,621, Cl. 414-523.000.

Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,312,243, Cl. 74-346.000.

Ritter, Josef: *See—*
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,312,243, Cl. 74-346.000.

Ritter, Klaus: *See—*
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,312,243, Cl. 74-346.000.

Ritter, Petry B.: *See—*
Day, Edward A.; Seay, Glenn E.; and Ritter, Petry B., 4,312,271, Cl. 102-202.130.

Rittman, Udo, to Clark Equipment Company. Pivoted valve and hood for lift truck. 4,312,418, Cl. 180-68.500.

Robert Bosch GmbH: *See—*
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,312,215, Cl. 73-35.000.
Herzog, Reinhold; Roth, Helmut; and Berger, Gunther, 4,312,256, Cl. 83-694.000.
Hoeller, Hans, 4,312,473, Cl. 229-56.000.
Hofer, Gerald; Schwarz, Manfred; and Konrath, Karl, 4,312,312, Cl. 123-340.000.
Leiber, Heinz; and Piesche, Gunter, 4,312,380, Cl. 137-627.500.

Roberts, Leland L. Feeder attachment for grain wagons. 4,312,297, Cl. 119-53.000.

Robertshaw Controls Company: *See—*
Brakebill, Harold G., 4,312,319, Cl. 123-568.000.
Gunter, James C., 4,312,122, Cl. 29-622.000.

Robillard, David R.; and Michals, Robert L., to Raytheon Company. Integrated test and assembly device. 4,312,117, Cl. 29-589.000.

Rochelt, Gunter, to Matsushita Electric Works, Ltd. Reciprocally driving means. 4,312,126, Cl. 30-43.920.

Rockwell International Corporation: *See—*
Grogan, Martin L., 4,313,094, Cl. 332-43.00R.
Southwell, William H., 4,312,570, Cl. 350-166.000.
White, Stanley A., 4,313,174, Cl. 364-753.000.

Rode, Konrad; Petersen, Erwin; and Lindemann, Klaus, to Wabco Fahrzeugbremsen GmbH. Control system for improving the steering stability of motor vehicles equipped with antiskid brake systems. 4,313,166, Cl. 364-426.000.

Rodighiero, Giovanni: *See—*
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.

Rodighiero, Paolo: *See—*
Baccichetti, Francarosa; Bordin, Franco; Carlassare, Francesco; Dall'Acqua, Francesco; Guiotto, Adriano; Pastorini, Giovanni; Rodighiero, Giovanni; Rodighiero, Paolo; and Vedaldi, Daniela, 4,312,883, Cl. 424-279.000.

Rogers, Norman H.; and O'Hanlon, Peter J., to Beecham Group Limited. Antibacterial compounds, processes for their preparation and compositions containing them. 4,312,867, Cl. 424-248.500.

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Rohm and Haas Company: *See—*
Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., 4,312,956, Cl. 521-28.000.

Rolf C. Hagen (USA) Corp.: *See—*
Holbrook, Arthur J., 4,313,048, Cl. 219-311.000.
Rolm Corporation: *See—*
Jabara, Michael D.; Jolissaint, Charles H.; Lieberman, David; and Edwards, John D., 4,313,036, Cl. 179-18.0AD.
Shepard, Robert R., 4,313,037, Cl. 179-81.00R.
Roma, Pierpaolo: *See—*
Bertelli, Guido; Roma, Pierpaolo; and Locatelli, Renato, 4,312,805, Cl. 260-45.9NP.
Roos, William G., to Best Lock Corporation. Cylinder lock with force-immune knob. 4,312,201, Cl. 70-422.000.
Rosen, Bruce I., to UOP Inc. Continuous reduction of edible oils. 4,312,814, Cl. 260-409.000.
Rosenbloom, Percy, Jr.; and Youngblood, Nancy P., to Technical Materials, Inc. System for preparing identification cards. 4,312,691, Cl. 156-267.000.
Rosenfeld, Jerold C.: *See—*
Salee, Gideon; and Rosenfeld, Jerold C., 4,312,975, Cl. 528-176.000.
Ross, Don H.; and Nussdorfer, Theodore J., to Sanders Associates, Inc. Wind loss prevention for open cavity solar receivers. 4,312,324, Cl. 126-418.000.
Rossetti, Michael: *See—*
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Roth, Helmut: *See—*
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Rothfuss, Robert G.; and Stith, Edwin L., Jr., to Senco Products, Inc. Surgical tissue thickness measuring instrument. 4,312,363, Cl. 128-774.000.
Roussel Uclaf: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,312,817, Cl. 260-465.00D.
Rousset, Paul: *See—*
Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, 4,312,709, Cl. 202-83.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Method and apparatus for classifying particles of powder metal. 4,312,748, Cl. 209-5.000.
Rubio, Manuel J. Making corn products. 4,312,892, Cl. 426-626.000.
Ruckdeschel, Frederick R.: *See—*
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Ruder, Gary C. F.: *See—*
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Rudloff, Georg: *See—*
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Rudolph, Volker: *See—*
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Rupprecht, Hans S.; and Woodall, Jerry M., to International Business Machines Corporation. Annealing of ion implanted III–V compounds in the presence of another III–V compound having higher dissociation pressure. 4,312,681, Cl. 148-1.500.
Rustman, James C.; and Mindel, Michael J., to RCA Corporation. Track error correction system as for video disc player. 4,313,134, Cl. 358-728.500.
Rutledge, Loren R.; and Siegle, James B., to Monsanto Company. System for converting synthetic turf surfaces from one to another condition. 4,312,504, Cl. 272-3.000.
Ryan, Charles P.: *See—*
Porter, Marion G.; and Ryan, Charles P., 4,313,158, Cl. 364-200.000.
Ryu, Ji-Yong, to UOP Inc. Process for the conversion of aromatic hydrocarbons. 4,312,785, Cl. 252-429.00R.
Ryu, Ji-Yong, to UOP Inc. Process for the conversion of aromatic hydrocarbons. 4,313,021, Cl. 585-470.000.
S&C Electric Company: *See—*
Schmunk, E. William, 4,313,100, Cl. 337-168.000.
Sabater, Jacques; and Bauduin, Serge, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and device for the measurement of linear speeds without contact and without marking. 4,312,592, Cl. 356-28.000.
Sable Freres International: *See—*
Aondetto, Bernard, 4,312,491, Cl. 248-575.000.
Sack GmbH: *See—*
Hansen, Manfred, 4,312,209, Cl. 72-237.000.
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Sagara, Seiji: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.
Saik, John D.; and English, Jack A., to CTS Corporation. Method for producing speaker construction. 4,312,118, Cl. 29-594.000.
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, to Toyama Chemical Co., Ltd. Process for producing 7-(substituted)amino-3-substituted thiomethyl-Δ^3-cephem-4-carboxylic acids. 4,312,986, Cl. 544-26.000.
Saint Gobain Industries: *See—*
Bonnet, Alain, 4,312,822, Cl. 264-70.000.
Saito, Syoji: *See—*
Masuda, Hiroshi; Sakai, Hirohiko; and Saito, Syoji, 4,312,656, Cl. 65-29.000.
Saitoh, Jun: *See—*
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Sakai, Hirohiko: *See—*
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Sakakima, Hiroshi; Senno, Harufumi; Yanagiuchi, Yukihiro; and Hirota, Eiichi, to Matsushita Electric Industrial Co., Ltd. Method for heat-treating amorphous alloy films. 4,312,683, Cl. 148-108.000.
Sakamoto, Kazuo; and Hayasaka, Takeshi, to Nippon Electric Co., Ltd. Signal-amplification frequency-conversion apparatus having a common active component. 4,313,223, Cl. 455-323.000.
Sakata, Takao: *See—*
Nakano, Tokutaka; Sakata, Takao; Iwama, Masamichi; and Isago, Takao, 4,313,193, Cl. 370-43.000.
Sakurai, Hisaya; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for polymerization of olefins. 4,312,783, Cl. 252-429.00B.
Sakurai, Naoyuki: *See—*
Kawana, Takeshi; Murai, Toshiaki; and Sakurai, Naoyuki, 4,312,109, Cl. 29-564.600.
Salee, Gideon; and Rosenfeld, Jerold C., to Hooker Chemicals & Plastics Corp. Bisphenol-dicarboxylic acid diester and compositions thereof with linear aromatic polyester having improved processability. 4,312,975, Cl. 528-176.000.
Salensky, George A.; and Martineau, Ronald A., to Union Carbide Corporation. Bonding of polyurethane to silicone rubber. 4,312,693, Cl. 156-272.000.
Salmon, Oliver N., to Minnesota Mining and Manufacturing Company. Energy conversion and storage process. 4,312,927, Cl. 429-17.000.
Salvati, John G., to Westinghouse Electric Corp. Circuit interrupter trip unit. 4,313,098, Cl. 335-42.000.
Sanada, Kei: *See—*
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Sanders Associates, Inc.: *See—*
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Sanders, James M.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,312,888, Cl. 426-3.000.
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Sangamo Weston, Inc.: *See—*
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Sanik, Paul S.: *See—*
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Sanshin Kogyo Kabushiki Kaisha: *See—*
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Sarikelle, Simsek. Interlocking prefabricated retaining wall system. 4,312,606, Cl. 405-286.000.
Sarkar, Arnab, to Corning Glass Works. Method and apparatus for making large diameter optical waveguide preforms. 4,312,654, Cl. 65-3.120.
Sato, Hideki: *See—*
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Hirano, Toru; and Sato, Hideki, 4,312,824, Cl. 264-135.000.
Sato, Hideo: *See—*
Seki, Masao; Sato, Hideo; Kawata, Takashi; Omori, Akira; and Abe, Hidekazu, 4,312,650, Cl. 55-459.00B.
Sato, Reisuke, to Pioneer Electronic Corporation. Car-mounted audio equipment. 4,313,090, Cl. 330-149.000.
Satoh, Ryozo, to Tel-Thermco Engineering Co., Ltd. Apparatus for thermal treatment of semiconductors. 4,312,294, Cl. 118-733.000.
Satoru, Kashimoto: *See—*
Shinji, Nishida; Takashi, Ohtsuka; Mitsukuni, Satoh; and Satoru, Kashimoto, 4,312,399, Cl. 164-418.000.
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Saxinger, Allan L.; Haigh, Clayton M.; and Kockler, Barry C., to Xerox Corporation. Spring-loaded friction retard separator. 4,312,503, Cl. 271-34.000.
Saylors, James A. Acoustic distance measuring method and apparatus. 4,313,183, Cl. 367-128.000.
Schaaf, Cecil; and Schaaf, Craig. Traffic barricade. 4,312,600, Cl. 404-6.000.
Schaaf, Craig: *See—*
Schaaf, Cecil; and Schaaf, Craig, 4,312,600, Cl. 404-6.000.
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Engler, Edward M.; Kuptsis, John D.; Schad, Robert G.; and Tomkiewicz, Yaffa, 4,312,936, Cl. 430-296.000.
Schaefer, Harold W., to National Union Electric Corporation. Method of making a brush-beater for a vacuum cleaner. 4,312,542, Cl. 300-21.000.
Schaeg, Werner: *See—*
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Schafer, August W., to Wilhelm Schafer Maschinenbau. Four-roller bending and rounding machine. 4,312,208, Cl. 72-166.000.
Schanze, Klaus: *See*—
Johne, Hans; Lucas, Christian; Foerster, Karl-Heinz; Schanze, Klaus; Jentsch, Arndt; Mueller, Wolfgang; and Schulz, Horst, 4,312,137, Cl. 34-43.000.
Scharf, Martin; and Meisel, Ulrich, to VEB Filmfabrik Wolfen. Photographic materials with antihalation means based upon silver halide emulsions. 4,312,941, Cl. 430-510.000.
Schatzler, Walter: *See*—
Jardin, Hans; Schatzler, Walter; and Sielk, Werner, 4,312,533, Cl. 296-214.000.
Jardin, Hans; and Schatzler, Walter, 4,312,534, Cl. 296-216.000.
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Cotte, Dietrich; Scheffler, Holger; Beyer, Gunter; Bugge, Dietmar; and Kuhn, Manfred, 4,312,194, Cl. 66-75.200.
Schering Corporation: *See*—
Gold, Elijah H.; and Chang, Wei, 4,312,863, Cl. 424-230.000.
Mayer, Joseph; Peer, Lydia; and Babad, Esther, 4,312,996, Cl. 564-92.000.
Schewe, Richard A., to Barber-Colman Company. Auto-loading tension compensator. 4,312,482, Cl. 242-154.000.
Schirmer, Gunter: *See*—
Dobler, Klaus; Zrenner, Christian; Schirmer, Gunter; and Kizler, Alfred, 4,312,215, Cl. 73-35.000.
Schlau, Peter, to Hartman & Braun Aktiengesellschaft. Measuring cell for detecting the concentration of UF_6 in H_2. 4,312,213, Cl. 73-27.00R.
Schlegel, Earl S.; and Page, Derrick J., to Westinghouse Electric Corp. Compression bonded electronic device comprising a plurality of discrete semiconductor devices. 4,313,128, Cl. 357-79.000.
Schlereth, Rudolf: *See*—
Blaurock, Gunter; Albert, Ernst; Reichert, Klaus; and Schlereth, Rudolf, 4,312,545, Cl. 308-6.00C.
Schlueter, William D.: *See*—
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Schlumberger Technology Corp.: *See*—
Zarudiansky, Alain; Janssen, Sylvain; and Tourret, Jean, 4,312,192, Cl. 62-514.00R.
Schmidt, Robert R.; and Faust, Wilfried, to Bayer Aktiengesellschaft. Compositions and methods for improving the tolerance by crop plants of herbicidally active acetanilides. 4,312,664, Cl. 71-92.000.
Schmitt, Frederick L.: *See*—
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Schmitt, Thomas E.: *See*—
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Schmitzler, Edward G.: *See*—
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Schmunk, E. William, to S&C Electric Company. Fuse tube with mildly tapered bore. 4,313,100, Cl. 337-168.000.
Schnabel, Wolfram: *See*—
Serbent, Harry; Reuter, Gerhard; Schnabel, Wolfram; and Eichberger, Heinz, 4,312,666, Cl. 75-11.000.
Schneider, Friedhelm: *See*—
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Schneider, Hartmut; and Papp, Alfred, to Siemens Aktiengesellschaft. Process for the production of a coated glass body. 4,312,653, Cl. 65-3.120.
Schneider, Jug: *See*—
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Schoeller Technical Papers, Inc.: *See*—
Kasper, Klaus B.; Quartz, William L.; and Myers, William H., 4,312,937, Cl. 430-496.000.
Schoemans, Jean; and Bouillet, Edmond, to Interox (Societe Anonyme). Process for the production of substituted anthraquinones. 4,312,811, Cl. 260-369.000.
Schoenbeck, Elroy A.: *See*—
Voges, Kenneth; Schoenbeck, Elroy A.; O'Hara, Mark F.; and Schmitt, Thomas E., 4,312,325, Cl. 126-423.000.
Scholkens, Bernward: *See*—
Bartmann, Wilhelm; Konz, Elmar; Lerch, Ulrich; and Scholkens, Bernward, 4,312,882, Cl. 424-275.000.
Scholl, Hans: *See*—
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Scholtz, Gilbert J.: *See*—
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Schoofs, Franciscus A. C. M.: *See*—
Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., 4,313,034, Cl. 179-16.00F.
Schoolar, Richard B., to United States of America, Navy. Method of preparing a thin-film, single-crystal photovoltaic detector. 4,312,114, Cl. 29-572.000.
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., to Hesston Corporation. Valve control mechanism. 4,312,245, Cl. 74-529.000.
Schroeder, Jack A.: *See*—
Carraher, Charles E., Jr.; Giron, David J.; Schroeder, Jack A.; and McNeely, Christy A., 4,312,981, Cl. 536-84.000.
Schror, Horst; and Spindler, Gert-Michael, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Shut-off device blocking spontaneous passage of spherical bulk material especially in quick emptying pipes of pebble bed reactors. 4,312,704, Cl. 376-265.000.
Schroter, Horst: *See*—
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Schubert, Dale W.; and Hines, Henry E., to Barry Wright Corporation. Caster assembly. 4,312,096, Cl. 16-44.000.
Schulz, Horst: *See*—
Johne, Hans; Lucas, Christian; Foerster, Karl-Heinz; Schanze, Klaus; Jentsch, Arndt; Mueller, Wolfgang; and Schulz, Horst, 4,312,137, Cl. 34-43.000.
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Schumaker, Robert R.: *See*—
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Schwan, Werner, to Heyligenstaedt & Comp. Werkzeugmaschinenfabrik GmbH. Cutting tool. 4,312,251, Cl. 82-36.00R.
Schwarz, Manfred: *See*—
Hofer, Gerald; Schwarz, Manfred; and Konrath, Karl, 4,312,312, Cl. 123-340.000.
Schwomma, Otto; Raimann, Gerhard; and Breit, Hans P., to Eumig Elektrizitats- und Metallwaren-Industrie Gesellschaft m.b.H. Watertight housing. 4,312,580, Cl. 354-64.000.
Science Union et Cie: *See*—
Regnier, Gilbert; and Bure, Jacques, 4,312,869, Cl. 424-250.000.
SCM Corporation: *See*—
Cox, Charles E.; and Eeckhout, Roger V., 4,313,047, Cl. 219-253.000.
Sherwood, Joseph C.; and Brunbeck, Richard T., 4,312,759, Cl. 210-710.000.
Scott, D. S.: *See*—
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Scott Paper Company: *See*—
Davis, George O., 4,313,153, Cl. 362-184.000.
Scriffignana, Peter J.; and Hadeler, Theodore T., to Bendix Corporation, The. Accurate level sensor. 4,312,131, Cl. 33-350.000.
Scuderi, Rudolph: *See*—
Fickenscher, Hermann; Hock, Richard H.; Ray, Richard C.; and Scuderi, Rudolph, 4,313,060, Cl. 307-23.000.
Seaman, Peter H.: *See*—
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Seay, Glenn E.: *See*—
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SEB S.A.: *See*—
LaFontaine, Pierre, 4,312,754, Cl. 210-267.000.
Sedley, Bruce S. Magnetic key operated hotel door lock. 4,312,198, Cl. 70-276.000.
Seeman, Jeffrey I., to Philip Morris Incorporated. Smoking compositions. 4,312,367, Cl. 131-276.000.
Segawa, Hideo; Koyama, Jiro; Nishihara, Hiroshi; and Masuda, Masamitsu, to Ricoh Co., Ltd. Optical control device. 4,312,562, Cl. 350-96.150.
Seifert, Gary A.: *See*—
Maschler, Francis S.; and Seifert, Gary A., 4,312,716, Cl. 204-15.000.
Seilly, Alec H.; and Mowbray, Dorian F., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,312,316, Cl. 123-499.000.
Seki, Masao; Sato, Hideo; Kawata, Takashi; Omori, Akira; and Abe, Hidekazu, to Ishikawajima-Harima Kukogto Kabushiki Kaisha. Particle separator. 4,312,650, Cl. 55-459.00B.
Seki, Nobuichi: *See*—
Suzuki, Sadao; Ichizawa, Yoshiyuki; and Seki, Nobuichi, 4,312,437, Cl. 198-404.000.
Sekiguchi, Keiji, to Toyama Industry Co., Ltd. Bag and process for manufacturing the same. 4,312,392, Cl. 150-3.000.
Sekine, Noriyuki; Tanaka, Shigeo; and Tanaka, Kazuo, to Sumitomo Chemical Company, Limited. Polyolefin resin composition. 4,312,964, Cl. 525-88.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Water soluble amine resins which are mannich bases. 4,312,799, Cl. 260-29.300.
Semmes, J. Gibson: *See*—
Davis, Ken W.; and McCay, Leo B., 4,312,318, Cl. 123-546.000.
Senco Products, Inc.: *See*—
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Senno, Harufumi: *See*—
Sakakima, Hiroshi; Senno, Harufumi; Yanagiuchi, Yukihiro; and Hirota, Eiichi, 4,312,683, Cl. 148-108.000.
Serbent, Harry; Reuter, Gerhard; Schnabel, Wolfram; and Eichberger, Heinz, to Metallgesellschaft AG. Steel making process. 4,312,666, Cl. 75-11.000.
Sezzi, Francesco: *See*—
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Shaeffer, Raymond P.: *See—*
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Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,312,799, Cl. 260-29.300.

Shahbabian, Set, to Mayfield Education and Research Fund. Method of creating and enlarging an opening in the brain. 4,312,353, Cl. 128-344.000.

Shainoff, John R., to Cleveland Clinic Foundation, The. Glyoxal agarose and zonal immobilization of proteins therewith. 4,312,727, Cl. 204-180.00G.

Shaped Charge Specialist, Inc.: *See—*
Camp, Donald L., 4,312,273, Cl. 102-310.000.

Sharp Kabushiki Kaisha: *See—*
Hibino, Shinichi, 4,312,773, Cl. 252-299.630.
Mochizuki, Daisuke; and Kitano, Shigeru, 4,313,180, Cl. 365-222.000.
Yoshida, Kunio, 4,313,186, Cl. 368-22.000.

Shaw, Julius. Insulating material of metal film bonded to non-woven glass fabric with ethylene/vinyl acetate copolymer adhesive. 4,312,909, Cl. 428-215.000.

Shea, Frederick L., Jr., to Great Lakes Carbon Corporation. Process for removal of solids from solvent refined coal solutions. 4,312,763, Cl. 210-777.000.

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Murphy, John P.; and Kuderna, Jerry G., 4,312,082, Cl. 4-228.000.

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Loshaek, Samuel; and Shen, Chah M., 4,312,725, Cl. 204-159.220.

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Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, 4,312,795, Cl. 260-18.00R.

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Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,312,804, Cl. 260-45.8NZ.

Shields, Theodore C., to Ashland Oil, Inc. Glyoxal-polyamine reaction products and process for their preparation. 4,312,999, Cl. 564-279.000.

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Weil, Thomas A.; Dzadzic, Peter M.; Shih, Chien-Cheng J.; and Price, Michael C., 4,313,011, Cl. 585-240.000.

Shih, David H.: *See—*
Christensen, Burton G.; and Shih, David H., 4,312,871, Cl. 424-263.000.

Shimizu, Katsuichi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.

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Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, 4,312,386, Cl. 139-92.000.

Shinagawa Refractories Co., Ltd.: *See—*
Shinji, Nishida; Takashi, Ohtsuka; Mitsukuni, Satoh; and Satoru, Kashimoto, 4,312,399, Cl. 164-418.000.

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Rutledge, Loren R.; and Siegle, James B., 4,312,504, Cl. 272-3.000.

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Gabler, Egmont; and Lehmann, Uwe, 4,313,219, Cl. 455-260.000.
Oestreich, Ulrich; and Zeidler, Guenter, 4,312,565, Cl. 350-96.230.
Schneider, Hartmut; and Papp, Alfred, 4,312,653, Cl. 65-3.120.

Siemer, Sidney R.; Gordon, Richard S.; and Nickell, Louis G., to W. R. Grace & Co. Ripening of grapes. 4,312,665, Cl. 71-113.000.

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Hughes, Richard L.; and Sigmon, Ned A., 4,312,552, Cl. 339-36.000.

Sigworth, Harry W., Jr., to Chevron Research Company. Solar collector headers. 4,312,687, Cl. 156-245.000.

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Axen, Udo F.; and Sih, John C., 4,312,810, Cl. 260-345.200.

Silvestri, Giovanni J. Vibration reducing mount system. 4,312,247, Cl. 74-574.000.

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Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,312,774, Cl. 252-629.000.

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Simpson, Leslie G., to Ford Motor Company. Method of treating sliding metal contact surfaces. 4,312,900, Cl. 427-181.000.

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Adams, Kenneth D.; and Creed, Gerald J., 4,312,284, Cl. 112-158.00R.
Ketterer, Stanley J., 4,312,285, Cl. 112-267.100.

Singerman, Gary M., to United States of America, Energy. Novel anisole mixture and gasoline containing the same. 4,312,636, Cl. 44-53.000.

Sink, Elmore L. Apparatus for filleting fish. 4,312,100, Cl. 17-56.000.

Sinkhorn, George T.: *See—*
Sinkhorn, Herman L.; and Sinkhorn, George T., 4,312,465, Cl. 224-36.000.

Sinkhorn, Herman L.; and Sinkhorn, George T. Handlebar mounted can holding device. 4,312,465, Cl. 224-36.000.

Sinozaki, Junichiro: *See—*
Komatsu, Fumito; Nakata, Kazuhiko; Sinozaki, Junichiro; Kazama, Eiichi; and Morishige, Hiroshi, 4,312,269, Cl. 101-93.040.

Sinus Medical Equipment AB: *See—*
Andersson, Torsten; and Ohlsson, Bjorn, 4,312,357, Cl. 128-664.000.

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Nurk, Siegfried, 4,312,195, Cl. 66-168.000.

Sirtl, Erhard: *See—*
Dietl, Josef; Holm, Claus; and Sirtl, Erhard, 4,312,850, Cl. 423-350.000.
Helmreich, Dieter; Sirtl, Erhard; and Zollner, Theo, 4,312,700, Cl. 156-616.00R.

Sisk, Francis J., to Westinghouse Electric Corp. Recirculating steam generator with super heat. 4,312,303, Cl. 122-34.000.

Sitt, Rudiger: *See—*
Junge, Bodo; Muller, Lutz; Sitt, Rudiger; Thomas, Gunter; Krause, Hans P.; and Puls, Walter, 4,312,872, Cl. 424-267.000.

Sittig, Robert C.: *See—*
Baker, James J.; Sittig, Robert C.; and Ciaramitaro, David A., 4,312,272, Cl. 102-275.800.

Sivahop, Albert: *See—*
Fischer, William C.; and Sivahop, Albert, 4,313,201, Cl. 371-68.000.

Siwiak, Kazimierz: *See—*
Garay, Oscar M.; and Siwiak, Kazimierz, 4,313,119, Cl. 343-702.000.

Skees, Hugh B.: *See—*
King, George E.; and Skees, Hugh B., 4,312,268, Cl. 101-1.000.

SKF Kugellagerfabriken GmbH: *See—*
Negele, Richard; and Birkenmaier, Wilhelm, 4,312,547, Cl. 308-187.100.

Sklair, Leonard. Reflector and cadence counter for joggers. 4,312,567, Cl. 350-98.000.

Skow, Lynn R., to Gemini Systems, Inc. Heat exchanger construction for solid fuel burning furnace. 4,312,321, Cl. 126-99.00A.

Slaten, Gary G., to Discovision Associates. Method for making a composite video disc. 4,313,190, Cl. 369-275.000.

Slattery, Gordon C. Compression relief system for internal combustion engine. 4,312,308, Cl. 123-182.000.

Smale, Alan J.: *See—*
Sowton, George E.; and Smale, Alan J., 4,312,356, Cl. 128-419.0PG.

Smith, Billy E.; and Smith, Carol H. Portable lighted study or game tray. 4,312,507, Cl. 273-237.000.

Smith, Carol H.: *See—*
Smith, Billy E.; and Smith, Carol H., 4,312,507, Cl. 273-237.000.

Smith, David W., to Caci, Inc. - Federal. Line drop compensation device for an electrical distribution system. 4,313,081, Cl. 323-209.000.

Smith, Frank J., Jr.: *See—*
Fisher, Warren; and Smith, Frank J., Jr., 4,312,172, Cl. 53-489.000.

Smith, Marnell; Katvala, Victor W.; and Porter, Ernest E., to United States of America, National Aeronautics and Space Administration. Spray coating apparatus having a rotatable workpiece holder. 4,312,292, Cl. 118-320.000.

Smith, Merrill M.; Holmstrom, Ernest R.; and Ferguson, Donald C., to American Biltrite Inc. Printed and embossed floor covering and method and apparatus for its manufacture. 4,312,686, Cl. 156-209.000.

Smith & Nephew Pharmaceuticals, Ltd.: *See—*
Clough, David; Drain, David J.; and Ruder, Gary C. F., 4,312,833, Cl. 422-30.000.

Smith, Norman; Riley, John G.; Huff, Edward R.; and Worcester, Dwight C., to University of Maine, Board of Trustees of the. Chip wood furnace and furnace retrofitting system. 4,312,278, Cl. 110-234.000.

Smith, Robert D. Clamp mounted foldable portable baby chair. 4,312,535, Cl. 297-174.000.

Smith, Russell D.; and Tressler, Richard E., to Kennecott Corporation. Chromium oxide coated refractory fibers. 4,312,911, Cl. 428-224.000.

Smyshlyaev, Vladimir V.: *See—*
Zalessky, Eduard A.; and Smyshlyaev, Vladimir V., 4,312,239, Cl. 73-861.290.

Snamprogetti, S.p.A.: *See—*
Chivilo', Fausto; and Sezzi, Francesco, 4,312,310, Cl. 123-198.0DB.
Olivieri, Roberto; Viglia, Aurelio; Degen, Ludwig; Angelini, Leonello; and Fascetti, Eugenio, 4,312,948, Cl. 435-253.000.

Snia Viscosa S.p.A.: *See—*
Ligutti, Marzio; and Bertotti, Elvio, 4,312,978, Cl. 528-300.000.

Snijders, Wilfred A. M.: *See—*
van Gerwen, Petrus J.; and Snijders, Wilfred A. M., 4,313,088, Cl. 328-63.000.
van Gerwen, Petrus J.; and Snijders, Wilfred A. M., 4,313,203, Cl. 375-17.000.

Snow, John P.; and Callahan, James J., to Houdaille Industries, Inc. Cyclic lubricant distributor valve. 4,312,425, Cl. 184-7.00D.

Snow, Thomas D. Router adapting fixture for radial arm saws. 4,312,391, Cl. 144-1.00F.

Snyder, Harold J., Jr.; Veca, Anthony R.; and Donck, Harry A., to United States of America, Energy. Spacer grid assembly and locking mechanism. 4,312,706, Cl. 376-442.000.

Snyder, Thomas A.; and Leible, Walter T., to Hillwood Corporation. Disposable swab and culture unit. 4,312,950, Cl. 435-295.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Busacca, Guido; Meli, Vincenzo; Passaglia, Arcangelo; and Sanfilippo, Michele, 4,313,091, Cl. 331-90.000.
Mazzocchi, Gabriele, 4,313,198, Cl. 370-112.000.

Societe Anonyme Francaise du Ferodo: *See—*
Filderman, Rene G., 4,312,182, Cl. 60-581.000.

Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
Lhonore, Pierre; Quibel, Jacques; and Jacquinot, Bernard, 4,313,009, Cl. 568-947.000.
Lhonore, Pierre; Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, 4,313,010, Cl. 568-948.000.

Soder, Alfons: *See—*
Boksay, Istvan; Soder, Alfons; Bollmann, Volkher; and Weber, Rolf-Ortwin, 4,312,861, Cl. 424-220.000.

Soichet, Samuel. Treatment of herpes simplex. 4,312,884, Cl. 424-283.000.

Sony Corporation: *See—*
Kojima, Chiaki; Ohki, Hiroshi; and Hasegawa, Kayoko, 4,312,559, Cl. 350-3.720.
Uchida, Hiroyuki, 4,313,142, Cl. 360-105.000.
Yoshida, Tadao; and Suzuki, Tadao, 4,313,065, Cl. 307-585.000.

Southwell, William H., to Rockwell International Corporation. High reflectivity coated mirror producing 90 degree phase shift. 4,312,570, Cl. 350-166.000.

Sowton, George E.; and Smale, Alan J., to Sowton, George Edgar. Pacemakers for tachycardia control. 4,312,356, Cl. 128-419.0PG.

Sowton, George Edgar: *See—*
Sowton, George E.; and Smale, Alan J., 4,312,356, Cl. 128-419.0PG.

Spademan, Richard G. Releasable ski binding with ski brake locating stop. 4,312,517, Cl. 280-605.000.

Sperry Corporation: *See—*
De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, 4,312,366, Cl. 130-27.00P.
Funk, Buddy K.; and Fowler, David M., III, 4,313,109, Cl. 340-365.00P.
Shenberger, Paul S., 4,312,267, Cl. 100-179.000.

Sperry Limited: *See—*
O'Sullivan, James P., 4,313,115, Cl. 343-5.0EM.

Spicuzza, John P., Jr., to Atlantic Richfield Company. Fast-cooling styrene polymer foams. 4,312,957, Cl. 521-60.000.

Spielvogel, Bernard F.; McPhail, Andrew T.; and Hall, Iris H., to United States of America, Army. Pharmacologically active amine boranes. 4,312,989, Cl. 546-13.000.

Spigolon, Silvio J.: *See—*
Wilson, Eddie K., Sr.; and Spigolon, Silvio J., 4,312,842, Cl. 423-178.000.

Spindler, Gert-Michael: *See—*
Schror, Horst; and Spindler, Gert-Michael, 4,312,704, Cl. 376-265.000.

Spurgeon, Weslin, to Jarva, Inc. Hard rock trench cutting machine having anchoring and steering structure. 4,312,541, Cl. 299-31.000.

Staats, James E., to General Electric Company. Slot configuration for choke seal. 4,313,044, Cl. 219-10.55D.

Staats, Timothy B., to University of California, Regents of. Modular knee finishing block and method of finishing an artificial limb. 4,312,080, Cl. 3-2.000.

Stadler, Peter: *See—*
Petersen, Uwe; Metzger, Karl G.; Zeiler, Hans-Joachim; Stadler, Peter; and Voss, Eckart, 4,312,859, Cl. 424-180.000.

Stahlhammer Bommern Gebr. Schneider: *See—*
Niemoller, Gerhard; Stromberg, Wilfried; and Schneider, Friedhelm, 4,312,443, Cl. 198-731.000.

Staiger, Donald W.: *See—*
Flickinger, William T.; and Staiger, Donald W., 4,312,828, Cl. 264-349.000.

Stalego, Joseph P.; and Lawson, Ernest E., to Owens-Corning Fiberglas Corporation. Composition and method of producing insoluble mag-oxy cements. 4,312,674, Cl. 106-105.000.

Stanadyne, Inc.: *See—*
Tolan, Lewis E., 4,312,479, Cl. 239-86.000.

Standard Oil Company: *See—*
Dolhyj, Serge R.; and Pepera, Marc A., 4,312,787, Cl. 252-435.000.
Pesa, Frederick A.; and Haase, Thomas A., 4,312,781, Cl. 252-414.000.

Standard Oil Company (Indiana): *See—*
Harper, Jon J., 4,312,714, Cl. 203-28.000.
Harper, Jon J., 4,312,778, Cl. 252-410.000.
Weil, Thomas A.; Dzadzic, Peter M.; Shih, Chien-Cheng J.; and Price, Michael C., 4,313,011, Cl. 585-240.000.
Wilder, Lawrence B., 4,312,405, Cl. 166-285.000.

Standard Register Company, The: *See—*
King, George E.; and Skees, Hugh B., 4,312,268, Cl. 101-1.000.

Stapinski, Paul A.: *See—*
Kaufman, Phillip A.; Washburn, Jerry R.; and Stapinski, Paul A., 4,313,160, Cl. 364-260.000.

Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, to North American Utility Construction Corp. Solar energy collection still. 4,312,709, Cl. 202-83.000.

Stauffer Chemical Company: *See—*
Mink, Robert; and Epstein, Ronald, 4,312,782, Cl. 252-429.00B.
Monty, Henri; Querido, Robert; and Benkwitt, Frances C., 4,312,843, Cl. 423-267.000.

Stauffer, Rita A. Apparatus for controlled liquid administration. 4,312,493, Cl. 251-8.000.

Stedman, Robert N., to Caterpillar Tractor Co. Extra lift mast for lift trucks. 4,312,427, Cl. 187-9.00E.

Steffen, Carlo. Modular construction element for building a pigeonhole-type wall. 4,312,454, Cl. 211-74.000.

Stegmann, Helmut: *See—*
Ackermann, Othmar; and Stegmann, Helmut, 4,312,947, Cl. 435-237.000.

Stein, Karl D.: *See—*
Holy, Norman L.; Logan, William A.; and Stein, Karl D., 4,313,018, Cl. 585-269.000.

Steinbauer, Frederick W., Jr.; and Lindstrom, Erik A., to United Technologies Corporation. Air cooled hollow vane construction. 4,312,624, Cl. 415-115.000.

Steinke, Alexander, to Kraftwerk Union Aktiengesellschaft. Spacer for nuclear reactor fuel assemblies. 4,312,705, Cl. 376-441.000.

Stelleman, Yan; and Jouan, Gerard. Sea cage for farming fish. 4,312,296, Cl. 119-3.000.

Stemen, David: *See—*
Szabo, Arthur D.; and Stemen, David, 4,313,069, Cl. 310-68.00C.

Stephen, John F.: *See—*
Kruse, Walter M.; and Stephen, John F., 4,313,000, Cl. 564-99.000.

Stephens, Jack E.: *See—*
Taylor, Harry M.; Braaten, Terry L.; Stephens, Jack E.; and Geraci, Donald C., 4,312,424, Cl. 184-6.400.

Stephens, Richard B., to Exxon Research & Engineering Co. Solar cell module. 4,313,023, Cl. 136-246.000.

Stephens, Walter R.; and Berstein, Patricio, to Exxon Research & Engineering Co. Fluid register system. 4,313,168, Cl. 364-465.000.

Sterling Drug Inc.: *See—*
Jarcho, Michael; and Rossetti, Michael, 4,312,821, Cl. 264-43.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,312,875, Cl. 424-266.000.

Stern, Ernest R.; and Ralston, Richard W., to Massachusetts Institute of Technology. Analog solid state memory. 4,313,178, Cl. 365-183.000.

Sternberg, Robert L., to United States of America, Navy. Ellipticized infrared lens providing balanced astigmatism. 4,312,573, Cl. 350-432.000.

Stewart, Gloria. Removable cover for faceplate of electrical switch or outlet. 4,312,458, Cl. 220-241.000.

Stewart, William G.; and Lawhon, David, to Refreshment Machinery Incorporated. Programmable electronic speed control. 4,313,075, Cl. 318-722.000.

Stith, Edwin L., Jr.: *See—*
Rothfuss, Robert G.; and Stith, Edwin L., Jr., 4,312,363, Cl. 128-774.000.

Stockton, Stephen A.: *See—*
Thomas, Donald W.; and Stockton, Stephen A., 4,313,032, Cl. 179-1.00E.

Stoutenburg, Donn V., to IRD Mechanalysis, Inc. Vibration analyzer with digital readout. 4,312,232, Cl. 73-659.000.

Strausser, Robert W. Method of freeze-drying flower arrangements. 4,312,134, Cl. 34-5.000.

Stromberg, Wilfried: *See—*
Niemoller, Gerhard; Stromberg, Wilfried; and Schneider, Friedhelm, 4,312,443, Cl. 198-731.000.

Stucki, Samuel: *See*—
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Stuemky, Robert E.: *See*—
Gibbs, Ralph H.; and Stuemky, Robert E., 4,312,193, Cl. 64-9.00R.
Sturm, Werner, to Von Roll A.G., a part interest. Welding sleeve of thermoplastic material. 4,313,053, Cl. 219-544.000.
Su, Stephen C.; and Finnila, Ronald M., to Hughes Aircraft Company. Signal detection method for IR detector having charge readout structure. 4,313,127, Cl. 357-30.000.
Subulak, Thomas; and Milewski, Joseph M. Smoke alarm having temporary disabling features. 4,313,110, Cl. 340-527.000.
Suenaga, Nobuyuki: *See*—
Suenaga, Norihiro; Sugiyama, Seiji; and Suenaga, Nobuyuki, 4,313,093, Cl. 331-94.50D.
Suenaga, Norihiro; Sugiyama, Seiji; and Suenaga, Nobuyuki, to Nippon Infrared Industries Co., Ltd. Laser device. 4,313,093, Cl. 331-94.50D.
Sugawa, Hiroshi. Multiple function actuator. 4,312,432, Cl. 192-4.00R.
Sugimoto, Hiroshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for vehicle sub-transmission shift control. 4,312,248, Cl. 74-861.000.
Sugiura, Yoji: *See*—
Ohniwa, Takehiko; and Sugiura, Yoji, 4,312,583, Cl. 354-234.000.
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Suenaga, Norihiro; Sugiyama, Seiji; and Suenaga, Nobuyuki, 4,313,093, Cl. 331-94.50D.
Suh, Kyung W.; and Jones, Jonathan R., to Dow Chemical Company, The. Styrene-acrylic acid copolymer foam. 4,312,910, Cl. 428-220.000.
Sullivan, Ann C.: *See*—
Guthrie, Robert W.; Kierstead, Richard W.; Mennona, Francis A.; and Sullivan, Ann C., 4,312,885, Cl. 424-317.000.
Sumitomo Chemical Company, Limited: *See*—
Aketa, Kohichi; Suzuki, Yukio; Ohno, Nobuo; Nakayama, Isamu; and Kato, Takashi, 4,312,816, Cl. 260-465.00D.
Sekine, Noriyuki; Tanaka, Shigeo; and Tanaka, Kazuo, 4,312,964, Cl. 525-88.000.
Suzukamo, Gohu; Takano, Tetsuo; Tamura, Mitsuhisa; and Ikimi, Kiyoshi, 4,312,717, Cl. 204-59.00R.
Summers, Gus E., to C. W. Zumbiel Company, The. Basket carrier. 4,312,446, Cl. 206-185.000.
Sunbeam Corporation: *See*—
Bollinger, William A.; and Hipp, Wilbur B., 4,312,176, Cl. 56-202.000.
Sundermeier, Gunter, to Paul Hettich & Co. Hinge for the doors of cabinets or the like. 4,312,098, Cl. 16-240.000.
Sundstrand Corporation: *See*—
Biagini, Guido, 4,312,191, Cl. 62-402.000.
Sunhouse, Inc.: *See*—
Zebuhr, William H., 4,312,401, Cl. 165-39.000.
Suzukamo, Gohu; Takano, Tetsuo; Tamura, Mitsuhisa; and Ikimi, Kiyoshi, to Sumitomo Chemical Company, Limited. Process for producing 2-(2'-methyl-1'-propenyl)-4-methyltetrahydropyran. 4,312,717, Cl. 204-59.00R.
Suzuki, Eiji. Valve mechanism of rolling seal type and gas lighter valves using the same. 4,312,389, Cl. 141-291.000.
Suzuki, Hisao: *See*—
Kawashima, Katsuhiro; Murota, Shoji; Nakamori, Yukio; and Suzuki, Hisao, 4,312,231, Cl. 73-643.000.
Suzuki, Keizo: *See*—
Hirose, Yoshinao; Yamamoto, Haruhiko; Suzuki, Keizo; Fukuchi, Isao; and Tsuchiya, Masahiro, 4,313,149, Cl. 361-394.000.
Suzuki, Sadao; Ichizawa, Yoshiyuki; and Seki, Nobuichi, to Yoshino Kogyosho Co., Ltd. Device for unloading bottle-shaped containers. 4,312,437, Cl. 198-404.000.
Suzuki, Tadao: *See*—
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Suzuki, Takehisa: *See*—
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Svoboda, Josef, to TMC Corporation. Braking blade and mounting therefor. 4,312,518, Cl. 280-605.000.
Svoboda, Josef; and Wittmann, Heinz, to TMC Corporation. Safety-straplike connecting member. 4,312,519, Cl. 280-637.000.
Swearingin, John D. Hog feeding device of improved durability. 4,312,298, Cl. 119-54.000.
Swedlow, Inc.: *See*—
Holdridge, David W., 4,312,330, Cl. 126-440.000.
Swenson, Henry F., to J & S Tool Company. Gear holding hydraulically actuated chuck. 4,312,513, Cl. 279-1.00G.
Swenson, Paul F.; and Moore, Paul B., to Consolidated Natural Gas Service Company, Inc. Heat pump system. 4,312,188, Cl. 62-160.000.
Swift, Thomas R.: *See*—
Parkinson, William R.; Swift, Thomas R.; and Ivanick, Paul F., 4,312,153, Cl. 49-485.000.
Swindler, Henry A.: *See*—
Tilling, Basil B.; and Swindler, Henry A., 4,312,373, Cl. 137-393.000.
SWS Silicones Corporation: *See*—
Martin, Eugene R., 4,312,993, Cl. 556-419.000.
Symon, Ted; Kurek, Paul R.; and Tufano, Michael D., to UOP Inc. Preparation of p-aminodiphenylamines. 4,313,002, Cl. 564-423.000.
Syntex (U.S.A.) Inc.: *See*—
Beard, Colin C., 4,312,873, Cl. 424-263.000.
Kennedy, Joe H.; and Broadhead, James H., 4,312,538, Cl. 297-408.000.
Systems, Science and Software: *See*—
Day, Edward A.; Seay, Glenn E.; and Ritter, Petry B., 4,312,271, Cl. 102-202.130.
Szabo, Arthur D.; and Stemen, David, to Westinghouse Electric Corp. Mounting for thermal protector used in dynamoelectric machine stator windings. 4,313,069, Cl. 310-68.00C.
Szal, Andrzej: *See*—
Przybyla, Janusz; Haczek, Leopold; Gozdziewicz, Zygmunt; Szal, Andrzej; Pieczyk, Jozef; and Maczynski, Andrzej, 4,312,207, Cl. 72-100.000.
Szucs, Murrill M. Medication having penetration through cutaneous surfaces into articular and muscular areas. 4,312,865, Cl. 424-243.000.
Taguchi, Michiichi; Funabiki, Kunio; Nakazima, Masao; Nunokawa, Hisao; Ikemi, Tadashi; Kimura, Masataka; and Shibata, Naoki, to Nissan Motor Co., Ltd. Paint composition comprising powder paint dispersed in aqueous resin solution. 4,312,795, Cl. 260-18.00R.
Takada, Juichiro. Vehicle seat belt guide. 4,312,539, Cl. 297-468.000.
Takagi, Toshio; and Yamakoshi, Yukinari, to Tokyo Denryoku Kabushiki Kaisha. Fault detecting system for locating a fault point with a fault resistance separately measured. 4,313,169, Cl. 364-492.000.
Takahashi, Akira: *See*—
Miyagawa, Fumihiro; and Takahashi, Akira, 4,312,581, Cl. 354-106.000.
Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, to Yoshida Kogyo K. K. Harness frame for looms. 4,312,386, Cl. 139-92.000.
Takahashi, Tadashi: *See*—
Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, 4,313,156, Cl. 363-54.000.
Takakura, Isamu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,312,986, Cl. 544-26.000.
Takano, Shuntaro: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,312,986, Cl. 544-26.000.
Takano, Tetsuo: *See*—
Suzukamo, Gohu; Takano, Tetsuo; Tamura, Mitsuhisa; and Ikimi, Kiyoshi, 4,312,717, Cl. 204-59.00R.
Takase, Sadao, to Nissan Motor Company, Limited. System for digital control of operation of internal combustion engine. 4,312,315, Cl. 123-479.000.
Takashi, Ohtsuka: *See*—
Shinji, Nishida; Takashi, Ohtsuka; Mitsukuni, Satoh; and Satoru, Kashimoto, 4,312,399, Cl. 164-418.000.
Takashima, Teruo: *See*—
Yamamoto, Kiyokazu; Fukami, Takushi; and Takashima, Teruo, 4,313,073, Cl. 318-577.000.
Takaya, Katsuhiko: *See*—
Sakurai, Hisaya; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,312,783, Cl. 252-429.00B.
Takeda Chemical Industries, Ltd.: *See*—
Iwasa, Susumu; Ueno, Hayao; and Wakimasu, Mitsuhiro, 4,312,943, Cl. 435-7.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Nishiura, Junji, 4,313,200, Cl. 371-25.000.
Takeda, Toshiyuki: *See*—
Yamazaki, Hitoshi; Ito, Hiroshi; Takeda, Toshiyuki; and Enomoto, Junzo, 4,312,895, Cl. 427-67.000.
Takemoto, Hisao; and Igarashi, Tatsuo, to Toyo Soda Manufacturing Co., Ltd. Polysaccharides containing allose. 4,312,979, Cl. 536-1.000.
Takeuchi, Hisaharu: *See*—
Yanagida, Seiichi; Takeuchi, Hisaharu; and Nishina, Masamitu, 4,313,141, Cl. 360-78.000.
Takeuchi, Teruo: *See*—
Kobayashi, Toshiaki; Takeuchi, Teruo; and Nakamura, Mamoru, 4,312,796, Cl. 260-23.0XA.
Takikawa, Osamu: *See*—
Ninomiya, Susumu; Ohtsuka, Fumio; Nei, Hiromichi; Harata, Mituo; Takikawa, Osamu; and Imai, Atsuo, 4,312,733, Cl. 204-195.00S.
Tallerico, Paul J.: *See*—
Wilson, Mahlon T.; and Tallerico, Paul J., 4,313,072, Cl. 315-5.000.
Tamura, Hisaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Patient supporting table top in medical examination and therapy apparatus. 4,312,912, Cl. 428-244.000.
Tamura, Mitsuhisa: *See*—
Suzukamo, Gohu; Takano, Tetsuo; Tamura, Mitsuhisa; and Ikimi, Kiyoshi, 4,312,717, Cl. 204-59.00R.
Tanaka, Kazuhiro; and Maekawa, Yutaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Multistage flash evaporator. 4,312,710, Cl. 202-173.000.
Tanaka, Kazuo: *See*—
Sekine, Noriyuki; Tanaka, Shigeo; and Tanaka, Kazuo, 4,312,964, Cl. 525-88.000.
Tanaka, Kiyoshi: *See*—
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,312,986, Cl. 544-26.000.
Tanaka, Kohji: *See*—
Kato, Hiroshi; and Tanaka, Kohji, 4,312,257, Cl. 84-1.030.
Tanaka, Minoru, to Hanazono Kogu Kabushiki Kaisha. Cutting tool. 4,312,127, Cl. 30-92.000.

Tanaka, Shigeo: *See*—
Sekine, Noriyuki; Tanaka, Shigeo; and Tanaka, Kazuo, 4,312,964, Cl. 525-88.000.

Tanaka, Yasunobu: *See*—
Otsu, Takatoshi; Tanaka, Yasunobu; Fukushima, Osamu; Mituhashi, Takeshi; Mizuno, Tadatune; Ogawa, Toshiko; and Ichikawa, Kazuo, 4,312,585, Cl. 354-321.000.

Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,312,305, Cl. 123-51.0BA.

Tandy Brands, Inc.: *See*—
Clark, Earl J., 4,312,466, Cl. 224-243.000.

Tannery, Edward F., to Theodore Bargman Company. Compact ambidextrous locking mechanism. 4,312,527, Cl. 292-49.000.

Tarnero, Maurice: *See*—
Auchapt-Tavenaux, Jacqueline; Auchapt, Pierre; Sauvage, Henri; and Tarnero, Maurice, 4,312,836, Cl. 422-198.000.

Tate & Lyle Ltd.: *See*—
Jones, Haydn F., 4,313,008, Cl. 568-844.000.

Tax, Lambert J. W. M., to Akzona Incorporated. Branched chain and cycloaliphatic esters of the androstane and destrane series and pharmaceutical compositions containing same. 4,312,864, Cl. 424-238.000.

Taylor, Colin: *See*—
Harris, David L.; and Taylor, Colin, 4,312,397, Cl. 164-7.100.

Taylor, Harry M.; Braaten, Terry L.; Stephens, Jack E.; and Geraci, Donald C., to Washington Irrigation & Development Company. Automatic grease lubrication system for metering and dispensing lubrication grease onto rolling-sliding, line contact, bearing surface surface. 4,312,424, Cl. 184-6.400.

Taylor, Wesley L.: *See*—
Adams, Harold P.; Taylor, Wesley L.; and Blanchard, James B., 4,312,226, Cl. 73-336.000.

Taylor, William F. Swimming apparel flotation device. 4,312,089, Cl. 9-8.00R.

Teche, Andre: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,312,817, Cl. 260-465.00D.

Technical Materials, Inc.: *See*—
Rosenbloom, Percy, Jr.; and Youngblood, Nancy P., 4,312,691, Cl. 156-267.000.

Tel-Thermco Engineering Co., Ltd.: *See*—
Satoh, Ryozo, 4,312,294, Cl. 118-733.000.

Teledyne Adams, a Division of Teledyne Isotopes, Inc.: *See*—
Knecht, Helmut, 4,312,377, Cl. 137-625.190.

Teli, Jonathan P.; and Worley, Robert F., to Donn Incorporated. Fire-resistant demountable partition structure. 4,312,158, Cl. 52-39.000.

Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyor. 4,312,442, Cl. 198-561.000.

Tempmaster Corporation: *See*—
Edwards, Douglas F.; Zimmer, Ronald S.; and Dean, Raymond H., 4,312,475, Cl. 236-49.000.

Terada, Seiko: *See*—
Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, 4,312,386, Cl. 139-92.000.

Terzian, Rouben T., to Marvin Glass & Associates. Animated doll. 4,312,150, Cl. 46-120.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,312,817, Cl. 260-465.00D.

Tetra Pack International AB: *See*—
Holmstrom, Sven N. H., 4,312,255, Cl. 83-582.000.

Tetra Pak Development S.A.: *See*—
Reil, Wilhelm, 4,312,450, Cl. 206-605.000.

Tetsudo Kizai Kogyo Company Limited: *See*—
Matsuo, Yoshio; and Matsubara, Kentaro, 4,312,478, Cl. 238-349.000.

Texaco Development Corporation: *See*—
Carver, Thomas R.; and Armistead, Fontaine C., 4,312,329, Cl. 126-439.000.

Texaco Inc.: *See*—
Juran, Kenneth P., 4,312,626, Cl. 417-53.000.
Loftus, Jordan, 4,312,637, Cl. 48-77.000.
Woodle, Robert A., 4,312,594, Cl. 366-150.000.

Texas Instruments Incorporated: *See*—
Barney, George M., 4,312,358, Cl. 128-670.000.
Cooper, Lawrence E., 4,312,307, Cl. 123-145.00A.
Eder, Kenneth C., 4,313,227, Cl. 455-617.000.

Textile Products Incorporated: *See*—
Rheaume, Walter A., 4,312,913, Cl. 428-257.000.

Thaxton, Inc.: *See*—
Leslie, Bruce E., 4,312,708, Cl. 376-203.000.

Theodore Bargman Company: *See*—
Tannery, Edward F., 4,312,527, Cl. 292-49.000.

Theurer, Josef; Bock, Gernot; and Ganguly, Mihir, to Franz Plasser Bahnbaumaschi nen-Industriegesellschaft m.b.H. Immersion depth control for ballast tamping tools. 4,312,275, Cl. 104-12.000.

Thir, Basil: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,312,966, Cl. 525-425.000.

Thomas, Alain M.: *See*—
Maitre, Xavier C.; and Thomas, Alain M., 4,313,194, Cl. 370-69.000.

Thomas & Betts Corporation: *See*—
Donaher, Charles J.; and Christensen, Gordon D., 4,312,555, Cl. 339-75.0MP.

Thomas, Donald G. Method and apparatus for supplying electric current to a number of electrical loads. 4,313,061, Cl. 307-32.000.

Thomas, Donald W.; and Stockton, Stephen A., to Invironments Inc. Folded horn loudspeaker system. 4,313,032, Cl. 179-1.00E.

Thomas, Gunter: *See*—
Junge, Bodo; Muller, Lutz; Sitt, Rudiger; Thomas, Gunter; Krause, Hans P.; and Puls, Walter, 4,312,872, Cl. 424-267.000.

Thomas, Richard D. Key construction. 4,312,200, Cl. 70-408.000.

Thomas, Rudy V.; Pickett, David A.; and Harrell, Terry R., to Allied Corporation. Safety belt retractor assembly utilizing vehicle structure. 4,312,521, Cl. 280-806.000.

Thompson, Bruce R., to United Packages Limited. Screw fixing device. 4,312,612, Cl. 411-15.000.

Thompson, James W., Sr., to Porter Instrument Co., Inc. Device for administering an anesthetic gas. 4,312,339, Cl. 128-205.250.

Thompson, Thomas M. Continuous mining apparatus and method. 4,312,540, Cl. 299-11.000.

Thomson-CSF: *See*—
Dupressoir, Albert; and Bloch, Claude, 4,313,122, Cl. 343-818.000.
Jean-Frederic, Andre, 4,313,095, Cl. 333-116.000.

Thornburg, David D., to Xerox Corporation. Cursor control. 4,313,113, Cl. 340-709.000.

Thorne, Glenn A.; and Johnson, Archie G., to J-Tec Associates, Inc. Vortex generating device. 4,312,237, Cl. 73-861.220.

Thorns, Joachim; Meier, Klaus; and Jordan, Klaus, to Phoenix Aktiengesellschaft. Polyurethane pneumatic tire with neutral axis of sidewalls having increasing bending radius. 4,312,394, Cl. 152-353.00R.

Tilby, Sydney E.; and Vukelic, Branko, to Intercane Systems, Inc. Apparatus for separating the components of plant stalks. 4,312,677, Cl. 127-2.000.

Tilling, Basil B.; and Swindler, Henry A., to Parker-Hannifin Corporation. Internal valve. 4,312,373, Cl. 137-393.000.

Timpl, Rupert, to Max-Planck-Gesellschaft. Radioimmunological determination of procollagen (type III) and procollagen peptide (type III). 4,312,853, Cl. 424-1.000.

Tipper, Maynard J. G. Clipping device. 4,312,108, Cl. 29-243.560.

TMC Corporation: *See*—
Svoboda, Josef, 4,312,518, Cl. 280-605.000.
Svoboda, Josef; and Wittmann, Heinz, 4,312,519, Cl. 280-637.000.

Toepffer, Daniel H. Device for preparing the surface of ice rinks. 4,312,142, Cl. 37-1.000.

Tokyo Denryoku Kabushiki Kaisha: *See*—
Takagi, Toshio; and Yamakoshi, Yukinari, 4,313,169, Cl. 364-492.000.

Tokyo Electric Limited: *See*—
Maezawa, Kazuo; and Doumoto, Yasuo, 4,312,596, Cl. 366-343.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aoshima, Terutaka, 4,313,051, Cl. 219-441.000.
Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, 4,313,156, Cl. 363-54.000.
Miyazawa, Tatsuo, 4,312,707, Cl. 376-450.000.
Mizutani, Hiroyuki, 4,313,163, Cl. 364-414.000.
Ninomiya, Susumu; Ohtsuka, Fumio; Nei, Hiromichi; Harata, Mituo; Takikawa, Osamu; and Imai, Atsuo, 4,312,733, Cl. 204-195.00S.
Tamura, Hisaaki, 4,312,912, Cl. 428-244.000.
Yanagida, Seiichi; Takeuchi, Hisaharu; and Nishina, Masamitu, 4,313,141, Cl. 360-78.000.

Tolan, Lewis E., to Stanadyne, Inc. Fuel injection nozzle with edge filter. 4,312,479, Cl. 239-86.000.

Tolley, William K.; and Rademaker, Pieter D., to UOP Inc. Enhanced hydrometallurgical recovery of cobalt and nickel from laterites. 4,312,841, Cl. 423-150.000.

Tolmie, Robert J., Jr., to Pitney Bowes Inc. System and apparatus for compensating for the difference between the actuation and release points of a switch. 4,312,468, Cl. 226-9.000.

Tomkiewicz, Yaffa: *See*—
Engler, Edward M.; Kuptsis, John D.; Schad, Robert G.; and Tomkiewicz, Yaffa, 4,312,935, Cl. 430-296.000.
Engler, Edward M.; Kuptsis, John D.; Schad, Robert G.; and Tomkiewicz, Yaffa, 4,312,936, Cl. 430-296.000.

Tomlinson, George H., II, to Domtar Inc. Fluidized bed start up and operation. 4,312,702, Cl. 162-30.00R.

Tomlinson, Terence R.: *See*—
Isalski, Wieslaw H.; and Tomlinson, Terence R., 4,312,851, Cl. 423-359.000.

Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co. GmbH. Apparatus for automatically transporting liquid samples to an analyzer. 4,312,591, Cl. 356-315.000.

Tomy Kogyo Co., Inc.: *See*—
Iwao, Noriaki, 4,312,149, Cl. 46-40.000.

Tophinke, Franz: *See*—
Claas, Helmut; and Tophinke, Franz, 4,312,365, Cl. 130-27.00P.

Toppan Printing Co., Ltd.: *See*—
Yamamoto, Kiyokazu; Fukami, Takushi; and Takashima, Teruo, 4,313,073, Cl. 318-577.000.

Toray Industries Incorporated: *See*—
Kondo, Tsuneyuki; Miwa, Kishio; and Inoue, Takehisa, 4,313,014, Cl. 585-827.000.

Torrini, Ottavio. Method of tanning skins or hides. 4,312,632, Cl. 8-94.270.

Tosco Corporation: *See*—
Chiaramonte, Gerald R., 4,312,740, Cl. 208-11.00R.

Tourret, Jean: *See*—
Zarudiansky, Alain; Janssen, Sylvain; and Tourret, Jean, 4,312,192, Cl. 62-514.00R.

Towmotor Corporation: *See—*
McVeen, Milford D., 4,312,426, Cl. 187-9.00E.
Toyama Chemical Co., Ltd.: *See—*
Saikawa, Isamu; Takano, Shuntaro; Momonoi, Kaishu; Takakura, Isamu; Kuroda, Seietsu; Tanaka, Kiyoshi; Hayashi, Kenshin; Nagahashi, Bunei; and Kutani, Chiaki, 4,312,986, Cl. 544-26.000.
Toyama Industry Co., Ltd.: *See—*
Sekiguchi, Keiji, 4,312,392, Cl. 150-3.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Mori, Fumio; Itsubo, Junichi; Matsuda, Gunji; Hirano, Toru; and Sato, Hideki, 4,312,824, Cl. 264-135.000.
Shibasaki, Kyuichi, 4,313,171, Cl. 364-558.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Takemoto, Hisao; and Igarashi, Tatsuo, 4,312,979, Cl. 536-1.000.
Toyo Tanso Co., Ltd.: *See—*
Watanabe, Nobuatsu; Aramaki, Minoru; and Kita, Yasushi, 4,312,718, Cl. 204-60.000.
Toyomoto, Isao: *See—*
Aihara, Tetsuo; Nakayama, Yasuharu; Nakanishi, Kuninosuke; Yamashita, Yoshio; and Toyomoto, Isao, 4,312,797, Cl. 260-23.0AR.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,312,309, Cl. 123-188.00M.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,312,305, Cl. 123-51.0BA.
Sugimoto, Hiroshi; and Nakano, Jiro, 4,312,248, Cl. 74-861.000.
Tran, Danh C.: *See—*
Macedo, Pedro B.; Simmons, Catherine J.; Tran, Danh C.; Lagakos, Nicholas; and Simmons, Joseph, 4,312,774, Cl. 252-629.000.
Tranquilli, Romolo: *See—*
Diedrich, Heinz; Fazi, Marco; Fanti, Domenico; Mercuri, Angelo; and Tranquilli, Romolo, 4,312,115, Cl. 29-572.000.
Transamerica DeLaval Inc.: *See—*
Allen, Walter E., 4,312,376, Cl. 137-494.000.
Travaglini, Nicola. Heaterless hot nozzle. 4,312,630, Cl. 425-568.000.
Trayler, Robert J.: *See—*
Freese, Gary P.; and Trayler, Robert J., 4,312,411, Cl. 172-823.000.
Treadwell, Kenneth; and Bossert, Emily C., to M&T Chemicals Inc. Novel catalyst compositions and method for preparing polyurethane foams using same. 4,312,959, Cl. 521-107.000.
Treiman, Alfred A. Latchable garment hanger. 4,312,464, Cl. 223-85.000.
Tressler, Richard E.: *See—*
Smith, Russell D.; and Tressler, Richard E., 4,312,911, Cl. 428-224.000.
Triggs, Charles W.: *See—*
Pizzuti, Donato F.; and Triggs, Charles W., 4,312,582, Cl. 354-196.000.
TRW Inc.: *See—*
Kinder, Mark R., 4,312,379, Cl. 137-625.480.
Tsai, Shirley C.; and McIlvried, Howard G., III, to Gulf Research & Development Company. Catalytic production of octahydrophenanthrene-enriched solvent. 4,312,746, Cl. 208-143.000.
Tsuchiya, Hiroyuki; Funabashi, Kiyomi; and Kikuchi, Makoto, to Hitachi, Ltd. Iodine adsorbent. 4,312,647, Cl. 55-387.000.
Tsuchiya, Masahiro: *See—*
Hirose, Yoshinao; Yamamoto, Haruhiko; Suzuki, Keizo; Fukuchi, Isao; and Tsuchiya, Masahiro, 4,313,149, Cl. 361-394.000.
Tsukamoto, Kenkichi. Electro-acoustic transducer with free edge diaphragm. 4,313,040, Cl. 179-115.50R.
Tsutsumi, Hisao: *See—*
Kawano, Junichi; Tsutsumi, Hisao; and Utsugi, Toshiaki, 4,312,777, Cl. 252-352.000.
Tu, Hosheng; and Schlueter, William D., to UOP Inc. FCC Process using catalyst produced from used FCC catalyst. 4,312,743, Cl. 208-120.000.
Tu, Hosheng; and DeCoster, David C., to UOP Inc. FCC Process using low coke-make FCC catalyst. 4,312,744, Cl. 208-120.000.
Tuck, Julian S. W.: *See—*
Baumans, Hans W.; Tuck, Julian S. W.; Ahmad, Mohammad; Le Dinh, Chon T.; and Pinheiro, Victor, 4,313,172, Cl. 364-563.000.
Tufano, Michael D.: *See—*
Symon, Ted; Kurek, Paul R.; and Tufano, Michael D., 4,313,002, Cl. 564-423.000.
Tulowiecki, David, to Carrier Corporation. Positive shutoff. 4,312,474, Cl. 236-49.000.
Turiot, Andre: *See—*
Masclet, Jean; and Turiot, Andre, 4,312,429, Cl. 188-315.000.
Masclet, Jean; and Turiot, Andre, 4,312,485, Cl. 244-102.00R.
Turner, Clarence B.: *See—*
Shearer, John A.; Turner, Clarence B.; and Johnson, Irving, 4,312,280, Cl. 110-347.000.
Turner, Robert B. Grounding apparatus. 4,313,148, Cl. 361-212.000.
Turner, Thomas O.: *See—*
Mullen, Thomas W., III; Hultz, Richard M.; and Turner, Thomas O., 4,312,369, Cl. 131-290.000.
Tweed, Donald G., to Raychem Corporation. Connection system for heater strips. 4,312,121, Cl. 29-611.000.
Tye, Gene, to General Electric Company. Relative velocity gunsight system and method. 4,312,262, Cl. 89-41.0EA.
Tyler Refrigeration Corporation: *See—*
Ibrahim, Fayez F.; and Perez, Arthur, 4,312,190, Cl. 62-255.000.
Tyner, Alfred E., to Brunswick Corporation. V-Engine cooling system particularly for outboard motors. 4,312,304, Cl. 123-41.740.
UCB, Societe Anonyme: *See—*
Vrancken, August; and Dufour, Paul, 4,312,726, Cl. 204-159.230.
Uchida, Hiroyuki, to Sony Corporation. Mode changing apparatus for a tape recorder. 4,313,142, Cl. 360-105.000.
Uchida, Susumu; Yamamoto, Shigeo; and Wadaki, Tsutomu, to Kabushiki Kaisha Sankosah. Protective device for communication system. 4,313,147, Cl. 361-119.000.
Uchida, Yoshiro: *See—*
Esaki, Hisao; and Uchida, Yoshiro, 4,312,651, Cl. 55-502.000.
Ueno, Hayao: *See—*
Iwasa, Susumu; Ueno, Hayao; and Wakimasu, Mitsuhiro, 4,312,943, Cl. 435-7.000.
Uhrig, Heinz: *See—*
Cuntze, Ulrich; and Uhrig, Heinz, 4,312,631, Cl. 8-583.000.
Umezawa, Katsumi: *See—*
Fujii, Hisashi; Kamitake, Mikio; Mimura, Ryohei; and Umezawa, Katsumi, 4,312,649, Cl. 55-387.000.
Umezawa, Kazumi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 4,312,587, Cl. 355-8.000.
Union Carbide Corporation: *See—*
Bartley, William J., 4,312,955, Cl. 518-701.000.
Bostwick, Robert, 4,312,918, Cl. 428-379.000.
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., 4,312,894, Cl. 427-34.000.
Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., 4,312,973, Cl. 528-75.000.
Hunter, James C., 4,312,930, Cl. 429-191.000.
Salensky, George A.; and Martineau, Ronald A., 4,312,693, Cl. 156-272.000.
Union Special G.m.b.H.: *See—*
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Antos, George J., 4,312,792, Cl. 252-466.0PC.
Antos, George J., 4,313,020, Cl. 585-434.000.
Broughton, Donald B., 4,313,015, Cl. 585-828.000.
Gatsis, John G., 4,312,747, Cl. 208-177.000.
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Vadas, Leslie, to FMC Corporation. Method and apparatus for purging air from containers. 4,312,171, Cl. 53-403.000.
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Van Auken, Charles L., to Keystone Industries, Inc. Pellet gate for pneumatic discharge hopper car. 4,312,607, Cl. 406-128.000.
Van Blunk, Joseph J., to Boeing Company, The. Method of forming fiber and metal composite structures. 4,312,398, Cl. 164-108.000.
Vanderhoef, John, to Canadiana Garden Products Inc. Rotary lawn mower. 4,312,174, Cl. 56-320.200.
Van Deutekom, Huibert J. H., to U.S. Philips Corporation. Rechargeable electrochemical cell. 4,312,928, Cl. 429-27.000.
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Verrando, Marcel G., to Pall Corporation. Heat-reactivatable adsorbent gas fractionator and process. 4,312,640, Cl. 55-33.000.
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Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Diagnostic agent for the detection of component materials in liquid and process for producing same. 4,312,834, Cl. 422-56.000.
Voges, Kenneth; Schoenbeck, Elroy A.; O'Hara, Mark F.; and Schmitt, Thomas E., to Red Bud Industries, Inc. Solar heating system. 4,312,325, Cl. 126-423.000.
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Vranken, Roger A., to U.S. Philips Corporation. Flat electric coil with tap. 4,313,151, Cl. 361-402.000.
Vranken, Roger A., to U.S. Philips Corporation. Flat electric coil. 4,313,152, Cl. 361-402.000.
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Waddington, Anthony B. Tape cassette having internal drive with speed adjustment. 4,313,144, Cl. 360-132.000.

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Waier, Vincent J. Vehicle theft protection device. 4,312,452, Cl. 211-23.000.

Wakabayashi, Hiroharu; and Niiro, Yasuhiko, to Kokusai Denshin Denwa Co., Ltd. Monitoring system of an optical power in an optical repeater. 4,313,224, Cl. 455-601.000.

Wakahata, Tamotsu: *See—*
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Waki, Masahiko; and Maekawa, Yasuo, to Citizen Watch Co., Ltd. Water resisting crown structure for electronic wristwatches. 4,313,187, Cl. 368-319.000.

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Walker, Donald F.; and Phelps, Robert G., to Hughes Aircraft Company. Apparatus and method for digital combination of delta modulated data. 4,313,033, Cl. 179-1.00H.

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Wallis, William F., to Besser Company. Mechanical vibrator assembly. 4,312,242, Cl. 74-87.000.

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Walt, Hans; and Keller, Peter, to Keller AG Ziegeleien. Insulating bonded masonry. 4,312,164, Cl. 52-405.000.

Walters, Robert A., to ARCO Medical Products Company. Pacemaker with circuit for pulse width modulating stimulus pulses in accordance with programmed parameter control states. 4,312,354, Cl. 128-419.0PG.

Wang, Wei-Kung. Electric safety socket with internal locking means. 4,312,554, Cl. 339-74.00R.

Wanner, Hans; and Boppart, Kurt, to Fritz Haug AG. Process for applying a heat-barrier layer to a piston crown. 4,312,106, Cl. 29-156.50R.

Warner & Swasey Company, The: *See—*
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Wason, Satish K., to J. M. Huber Corporation. Method of producing amorphous silica of controlled oil absorption. 4,312,845, Cl. 423-339.000.

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Webb, Norma M. Portable bed adjusting device for patients and the like. 4,312,088, Cl. 5-509.000.

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Weil, Thomas A.; Dzadzic, Peter M.; Shih, Chien-Cheng J.; and Price, Michael C., to Standard Oil Company (Indiana). Plant hydrocarbon recovery process. 4,313,011, Cl. 585-240.000.

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Weissmueller, William R., to Zenith Radio Corporation. Integratable vertical sync separator. 4,313,137, Cl. 358-154.000.

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Welch, M. Bruce, to Phillips Petroleum Co. Catalyst and process of polymerization of alpha monoolefins. 4,312,784, Cl. 252-429.00B.

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Whaley, Haskell M., to Morris Whaley, Inc. Hydraulic winches. 4,312,497, Cl. 254-344.000.

Wheeler, Edward S., to Interpace Corporation. Methods of making high voltage electrical insulators and oil-less bushings. 4,312,123, Cl. 29-631.000.

Wheeler, Raymond L., to British Hovercraft Corporation. Method of making air cushion vehicle flexible skirts. 4,312,690, Cl. 156-253.000.

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White, Edward M., to Milford Rivet & Machine Co., The. Automatic arcuate brake shoe riveting machine and method. 4,312,107, Cl. 29-233.000.

White, James A.; and Rice, Frank L., to General Electric Company. Combination microwave oven and exhaust vent and installation mounting method therefor. 4,313,043, Cl. 219-10.55R.

White, James A., to Miles Laboratories, Inc. Sensor-integrator system. 4,313,067, Cl. 307-494.000.

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Whiteman Manufacturing Company: *See—*
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Whiteman, Marvin E., Jr., to Whiteman Manufacturing Company. Twin trowel cement finishing machine. 4,312,603, Cl. 404-112.000.

Whiteside, Wayland B. Fixture for cutting tube turns. 4,312,498, Cl. 266-56.000.

Whitlock, Ward P., to Racal Communications Inc. Electrical circuit arrangements, for example for use with communications receivers. 4,313,212, Cl. 455-146.000.

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Widmer, Walter R., to Gretag Aktiengesellschaft. Encipher-decipher device having semi-automatic generation of the code key during data entry. 4,313,031, Cl. 178-22.170.

Wiedmann, Siegfried K.: *See*—
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Wilber, James A.; and Christopher, Todd J, to RCA Corporation. Bidirectional deflector driver for video disc. 4,313,062, Cl. 307-108.000.

Wilder, Lawrence B., to Standard Oil Company (Indiana). Cementing procedure for casing. 4,312,405, Cl. 166-285.000.

Wilhelm Schafer Maschinenbau: *See*—
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William P. Young Co.: *See*—
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Williame, Paul H. R., to Produits Ballu-Schuiling S.A. Process for the preparation of a conglomerate sand ANF product. 4,312,671, Cl. 106-38.200.

Williams, David M. Devices for detecting levels. 4,312,225, Cl. 73-308.000.

Williams, Thomas D.: *See*—
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Willis, W. Coy, to Aluminum Company of America. Method and apparatus for everting a closure and separating a liner therefrom. 4,312,695, Cl. 156-344.000.

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Wills, Walter R., to Engelhard Minerals & Chemicals Corporation. Dewatering with electrically augmented vacuum filter. 4,312,729, Cl. 204-180.00P.

Wilms, Karl-Heinz, to Optische Werke G. Rodenstock. Phototopometer. 4,312,574, Cl. 351-7.000.

Wilson, C. Conway: *See*—
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Wilson, David A.; Crump, Druce K.; and Griffin, Freddie, Jr., to Dow Chemical Company, The. Preparation of a zinc chelate having improved stability. 4,312,815, Cl. 260-429.900.

Wilson, Eddie K., Sr.; and Spigolon, Silvio J. Process of manufacture of phosphoric acid with recovery of co-products. 4,312,842, Cl. 423-178.000.

Wilson, James C.; and Wilson, C. Conway. Compactor-feeder for solid waste incinerator. 4,312,279, Cl. 110-346.000.

Wilson, Mahlon T.; and Tallerico, Paul J., to United States of America, Energy. Light modulated switches and radio frequency emitters. 4,313,072, Cl. 315-5.000.

Wilt, Donald R., to Molins Machine Company, Inc. Sheet stack inverting apparatus. 4,312,502, Cl. 271-3.100.

Winegar, Donald L.; and Arde, Joseph M., Jr., to Duriron Company, Inc., The. Polymeric fluorocarbon rotomolding/rotolining composition. 4,312,961, Cl. 525-4.000.

Winkler, Edwin: *See*—
Anderson, James M.; Hassel, Richard O.; Inghram, Donald M.; and Winkler, Edwin, 4,312,619, Cl. 414-347.000.

Winslow, John S.; and Dakin, Wayne R., to Discovision Associates. Recording medium having a pilot signal with an aligned phase angle in adjacent tracks. 4,313,191, Cl. 369-275.000.

Wischhoefer, Larry L.: *See*—
Reimers, Stephen D.; and Wischhoefer, Larry L., 4,312,233, Cl. 73-861.010.

Witherspoon, Romeo R.; and Meibuhr, Stuart G., to General Motors Corporation. Zinc electrode containing porous calcium silicate. 4,312,931, Cl. 429-229.000.

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Wohltjen, Henry. Methods of detection with surface acoustic wave and apparati therefor. 4,312,228, Cl. 73-597.000.

Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., to W. R. Grace & Co. Preparation and use of enzymes bound to polyurethane. 4,312,946, Cl. 435-182.000.

Wood, Michael W. Dice game and teaching aid. 4,312,508, Cl. 273-274.000.

Wood, Peter: *See*—
Albery, John; and Wood, Peter, 4,312,715, Cl. 204-1.00T.

Wood, William M.: *See*—
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Woodle, Robert A., to Texaco Inc. Blending vessel and method of blending. 4,312,594, Cl. 366-150.000.

Woodward, Thomas R., to Burroughs Corporation. Clock derivation circuit for double frequency encoded serial digital data. 4,313,206, Cl. 375-110.000.

Wooley, Bruce A.: *See*—
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Wootton, Gordon, to Beecham Group Limited. Thiohydantoins having prostaglandin-like activities. 4,312,881, Cl. 424-273.00R.

Worcester, Dwight C.: *See*—
Smith, Norman; Riley, John G.; Huff, Edward R.; and Worcester, Dwight C., 4,312,278, Cl. 110-234.000.

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Wossner, Felix; Itzinger, Hermann; Handke, Gunther; and Koch, Wilhelm, to Fichtel & Sachs AG. Shock absorber assembly with operationally controlled hydraulic-mechanical damping system. 4,312,499, Cl. 267-8.00R.

Woudstra, Nico, to B. V. Neratoom. Nuclear reactor installation. 4,312,703, Cl. 376-299.000.

Wright, Dennis: *See*—
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Lu, Chin H., 4,312,933, Cl. 430-122.000.
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Thornburg, David D., 4,313,113, Cl. 340-709.000.

Yamada, Masaoki; Onogi, Kenji; and Ito, Ryozo, to Nippon Kogaku K.K. Method and apparatus of measuring the specific activity of dehydrogenases in tissue. 4,312,945, Cl. 435-26.000.

Yamada, Seiichi; Kamehara, Nobuo; Hashimoto, Kaoru; Yokoyama, Hiromitsu; Niwa, Koichi; and Murakawa, Kyohei, to Fujitsu Limited. Multilayer circuit boards. 4,313,026, Cl. 174-68.500.

Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Murakami, Hisamichi, to Mitsui Toatsu Chemicals, Inc. Heat sensitive recording sheet. 4,312,522, Cl. 282-27.500.

Yamaguchi, Keizaburo: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamamoto, Kiyokazu; Fukami, Takushi; and Takashima, Teruo, to Toppan Printing Co., Ltd.; and Watanabe Instruments Corp. Interactive graphic apparatus. 4,313,073, Cl. 318-577.000.

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Murase, Heihachi; and Yamamoto, Tutomu, 4,312,902, Cl. 427-386.000.

Yamamura, Akira, to Cambridge Thermionic Corporation. Turbomolecular vacuum pump having virtually zero power magnetic bearing assembly with single axis servo control. 4,312,628, Cl. 417-424.000.

Yamamura, Masahiro: *See*—
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Yamashita, Nobuo; and Maeda, Miwako, to Olympus Optical Co., Ltd. Focusing objective lens system for endoscopes. 4,312,572, Cl. 350-423.000.

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Yamazaki, Hitoshi; Ito, Hiroshi; Takeda, Toshiyuki; and Enomoto, Junzo, to Mitsubishi Denki Kabushiki Kaisha. Method for preparing water-soluble lacquer. 4,312,895, Cl. 427-67.000.

Yan, Tsoung-yuan, to Mobil Oil Corporation. Ion exchange resins of high loading capacity, high chloride tolerance and rapid elution for uranium recovery. 4,312,838, Cl. 423-7.000.

Yanagida, Seiichi; Takeuchi, Hisaharu; and Nishina, Masamitu, to Tokyo Shibaura Denki Kabushiki Kaisha. Position shift apparatus. 4,313,141, Cl. 360-78.000.

Yanagiuchi, Yukihiro: *See*—
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Yankoff, Gerald K. Cutting insert and method of machining therewith. 4,312,250, Cl. 82-1.00C.

Yasuda, Hirotsugu: *See*—
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Yokoyama, Hiromitsu: *See*—
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Yokoyama, Naokata, to Ciba-Geigy Corporation. Pyrazoloquinolines. 4,312,870, Cl. 424-258.000.
Yoneda, Haruyuki: *See*—
Sakurai, Hisaya; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,312,783, Cl. 252-429.00B.
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Yoshida, Junichi, to Casio Computer Co., Ltd. Electric apparatus for displaying a plurality of key symbols on a single passive display. 4,313,108, Cl. 340-365.0VL.
Yoshida Kogyo K K: *See*—
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Yoshida, Kunio, to Sharp Kabushiki Kaisha. Electronic timepiece with time zone change features. 4,313,186, Cl. 368-22.000.
Yoshida, Mitsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing nitrites. 4,312,722, Cl. 204-91.000.
Yoshida, Tadao; and Suzuki, Tadao, to Sony Corporation. Switching circuit with MOS field effect transistor. 4,313,065, Cl. 307-585.000.
Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshinori, Watanabe: *See*—
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Yost, Thomas D., to RCA Corporation. Keying signal generator with false output immunity. 4,313,130, Cl. 358-21.00R.
Young, Nien-Tzu. Chopsticks assembly. 4,312,530, Cl. 294-16.000.
Young, William P., to William P. Young Co. Machine for applying base cups to bottles. 4,312,439, Cl. 198-433.000.
Youngblood, Nancy P.: *See*—
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Yu, Ruey J.; and Berg, Morris, to General Motors Corporation. Thick film resistor paste and resistors therefrom. 4,312,770, Cl. 252-514.000.
Yundt, Albert P.: *See*—
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Zahn, Markus: *See*—
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Przybyla, Janusz; Haczek, Leopold; Gozdziewicz, Zygmunt; Szal, Andrzej; Pieczyk, Jozef; and Maczynski, Andrzej, 4,312,207, Cl. 72-100.000.
Zalessky, Eduard A.; and Smyshlyaev, Vladimir V. Method and apparatus for ultrasonic measurement of the rate of flow. 4,312,239, Cl. 73-861.290.
Zarr, Myron, to Minnesota Mining and Manufacturing Co. Head positioning mechanism for data cartridge recorder. 4,313,143, Cl. 360-106.000.
Zarudiansky, Alain; Janssen, Sylvain; and Tourret, Jean, to Schlumberger Technology Corp. Borehole logging tool cryostat. 4,312,192, Cl. 62-514.00R.
Zaugg, Paul, to BBC Brown, Boveri & Company, Ltd. Gas turbine power plant with air reservoir and method of operation. 4,312,179, Cl. 60-39.020.
Zebuhr, William H., to Sunhouse, Inc. Heat transfer system. 4,312,401, Cl. 165-39.000.
Zeidler, Guenter: *See*—
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Zeiler, Hans-Joachim: *See*—
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Zernow, Louis, to Whittaker Corporation. Method for selecting warhead fragment size. 4,312,274, Cl. 102-493.000.
Zichner, Ludwig: *See*—
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Zick, Gregory L., to Cordis Corporation. Oxygen sensing. 4,312,332, Cl. 128-635.000.
Zimmer, Ronald S.: *See*—
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Zimmermann, Robert: *See*—
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Zimpro AEC Ltd.: *See*—
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Zinke, Horst: *See*—
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Zissimopoulos, Nick; and Baron, John, to Baxter Travenol Laboratories, Inc. Bubble detector. 4,312,341, Cl. 128-214.00E.
Zollner, Theo: *See*—
Helmreich, Dieter; Sirtl, Erhard; and Zollner, Theo, 4,312,700, Cl. 156-616.00R.
Zoltan, Bart J.; and Leese, Richard A., to American Cyanamid Company. Thermal control means for liquid chromatograph samples. 4,312,835, Cl. 422-70.000.
Zrenner, Christian: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JANUARY, 1982

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Plewes, John T.; and White, Philip R., Re. 30,854, Cl. 75-154.000.

Cantor, Paul A.: *See*—
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., Re. 30,856, Cl. 264-41.000.

Chen, Yew-Tsung, to Pitney Bowes Inc. Powder metal composition. Re. 30,855, Cl. 75-251.000.

Fisher, Bruce S.: *See*—
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., Re. 30,856, Cl. 264-41.000.

Harper, Kenneth B., to Motorola, Inc. Cassette record player-recorder. Re. 30,853, Cl. 242-198.000.

Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to United States of America, America. Polycarbonate membranes and production thereof. Re. 30,856, Cl. 264-41.000.

Motorola, Inc.: *See*—
Harper, Kenneth B., Re. 30,853, Cl. 242-198.000.

Pitney Bowes Inc.: *See*—
Chen, Yew-Tsung, Re. 30,855, Cl. 75-251.000.

Plewes, John T.; and White, Philip R., to Bell Telephone Laboratories, Incorporated. Free machining Cu—Ni—Sn alloys. Re. 30,854, Cl. 75-154.000.

United States of America
America: *See*—
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., Re. 30,856, Cl. 264-41.000.

White, Philip R.: *See*—
Plewes, John T.; and White, Philip R., Re. 30,854, Cl. 75-154.000.

LIST OF DESIGN PATENTEES

Abramson, Alan: *See*—
Stiles, Theodore R.; and Abramson, Alan, 262,757, Cl. D6-85.000.

Adams, Robert W.; Newton, Ellen; and Stansberry, Frederick E. Beverage container holder attachment for a hot tub. 262,760, 1-26-82, Cl. D6-93.000.

Adidas Fabrique de Chaussures de Sport: *See*—
Anderie, Wolf, 262,751, Cl. D2-310.000.

Agfa-Gevaert AG: *See*—
Schlagheck, Norbert, 262,799, Cl. D16-30.000.

Amorse, Franklyn J.: *See*—
Piarulli, Vincent J.; Amorse, Franklyn J.; and Nunlist, Erwin J., 262,791, Cl. D12-214.000.

Anderie, Wolf, to Adidas Fabrique de Chaussures de Sport. Athletic shoe. 262,751, 1-26-82, Cl. D2-310.000.

Arthur, Richard P.; Rund, Joseph V.; and Mango, Joseph R., to Sunbeam Corporation. Snow thrower. 262,797, 1-26-82, Cl. D15-12.000.

Baird, Norman, to Duro Test Corp. Electric lamp. 262,828, 1-26-82, Cl. D26-2.000.

Bernier, Gerard J. Chassis mounted superstructure carrying frame for soft-top vehicles. 262,790, 1-26-82, Cl. D12-156.000.

Black & Decker Inc.: *See*—
House, Lawrence E., II, 262,823, Cl. D24-28.000.

Bovet, Thomas, to Mike & Kremmel Limited. Condiment dispenser. 262,767, 1-26-82, Cl. D7-54.000.

Bovet, Thomas, to Mike & Kremmel Limited. Condiment dispenser. 262,768, 1-26-82, Cl. D7-54.000.

Bradford Novelty Co., Inc.: *See*—
Burnbaum, Jack, 262,783, Cl. D11-124.000.

Brefka, Paul E.: *See*—
Hathaway, Dana B.; Latham, Peter A.; and Brefka, Paul E., 262,793, Cl. D14-33.000.

Britt, William J.; and Wilson, Daniel C., to Morton-Norwich Products, Inc. Bottle. 262,777, 1-26-82, Cl. D9-383.000.

Britt, William J.; and Wilson, Daniel C., to Morton-Norwich Products, Inc. Bottle. 262,778, 1-26-82, Cl. D9-404.000.

Buchi Laboratories-Tehnik AG: *See*—
Schindler, Jurgen H. R., 262,822, Cl. D24-8.000.

Bunger, Richard E. Animal confinement barn. 262,826, 1-26-82, Cl. D25-30.000.

Burnbaum, Jack, to Bradford Novelty Co., Inc. Christmas decoration. 262,783, 1-26-82, Cl. D11-124.000.

Caldwell, Francis E.; and Hagan, Robert E. Eyeglass frame display rack. 262,759, 1-26-82, Cl. D6-114.000.

Carbajalas Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., to John J. Madison Co. Inc. Figurine of an orangutan. 262,784, 1-26-82, Cl. D11-158.000.

Carbajales Santa Eulalia, Javier B.: *See*—
Carbajalas Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 262,784, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 262,785, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 262,786, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 262,787, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of a basset pup. 262,785, 1-26-82, Cl. D11-158.000.

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Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co. Inc. Figurine of a chihuahua. 262,787, 1-26-82, Cl. D11-158.000.

Carruthers, Thomas R., to Fleming Fabrications Ltd. Heat exchanger. 262,820, 1-26-82, Cl. D23-136.000.

Coles, Robert E.: *See*—
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Data Packaging Corporation: *See*—
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Deflecto Corporation: *See*—
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Dignan, Bernard J. Surgical tray for ophthalmic instruments. 262,824, 1-26-82, Cl. D24-31.000.

Dreyer, Charles B.; and Frassanito, John R., to Transaction Control Industries. Management action terminal. 262,794, 1-26-82, Cl. D14-106.000.

Dulude, Charles R. Gun target. 262,819, 1-26-82, Cl. D22-15.000.

Dunn, Howard E. Safety device for self propelled land vehicles. 262,789, 1-26-82, Cl. D12-155.000.

Duro Test Corp.: *See*—
Baird, Norman, 262,828, Cl. D26-2.000.

E-A-R Corporation: *See*—
Lilley, Daniel T., Jr., 262,775, Cl. D8-402.000.

Epicure Products, Inc.: *See*—
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Erdell, John B. Table lamp. 262,830, 1-26-82, Cl. D26-93.000.

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Glass, James L.; Rettberg, Harvey C.; Ryer, Richard N., II; and Sistare, James R., to Singer Company, The. Portable circular saw. 262,772, 1-26-82, Cl. D8-66.000.
Gleason, James V. Lottery die. 262,804, 1-26-82, Cl. D21-41.000.
Goldhound International, Inc.: *See*—
Oldendorf, Eric W., 262,798, Cl. D15-21.000.
Griffith, John D. Manual swimming aid. 262,817, 1-26-82, Cl. D21-238.000.
Haak, Larry C. Building for washing automobiles or other automotive vehicles. 262,825, 1-26-82, Cl. D25-25.000.
Hagan, Robert E.: *See*—
Caldwell, Francis E.; and Hagan, Robert E., 262,759, Cl. D6-114.000.
Hanson, Thomas E., to SCM Corporation. Steam iron. 262,771, 1-26-82, Cl. D32-70.000.
Hathaway, Dana B.; Latham, Peter A.; and Brefka, Paul E., to Epicure Products, Inc. Loudspeaker. 262,793, 1-26-82, Cl. D14-33.000.
Hayden, M. Dean, Jr. Jacket-type coaster. 262,766, 1-26-82, Cl. D7-45.000.
Hoffberger, Charles C. Sabbath bread loaf holder. 262,769, 1-26-82, Cl. D7-99.000.
Hoffman, Robert C., to Qwint Systems, Inc. Teleprinter. 262,796, 1-26-82, Cl. D14-93.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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70 S 4,313,027
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151 4,313,030

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215 4,312,415

CLASS 177

50 4,312,416

CLASS 178

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CLASS 179

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16 F 4,313,034
18 AD 4,313,036
18 BE 4,313,035
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84 VF 4,313,038
98 4,313,039
115.5 R 4,313,040

CLASS 180

8 A 4,312,417
68.5 4,312,418
177 4,312,419

CLASS 181

146 4,312,420
202 4,312,421
272 4,312,422

CLASS 182

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CLASS 184

6.4 4,312,424
7 D 4,312,425

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CLASS 188

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149 4,312,435

CLASS 194

4 R 4,312,436

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519 4,312,441
561 4,312,442
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835 4,312,445

CLASS 200

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61.04 4,313,042

CLASS 202

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28 4,312,714

CLASS 204

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4,312,721
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117 4,312,724
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159.23 4,312,726
180 G 4,312,727
180 P 4,312,729
180 S 4,312,728
181 R 4,312,730
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192 R 4,312,731
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195 S 4,312,733
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255 4,312,736
257 4,312,737
282 4,312,738
299 R 4,312,739

CLASS 206

185 4,312,446
370 4,312,447
409 4,312,448
466 4,312,449
605 4,312,450
628 4,312,451

CLASS 208

11 LE 4,312,741
11 R 4,312,740
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120 4,312,743
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CLASS 222

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CLASS 226

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150 4,312,469
183 4,312,470

CLASS 227

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CLASS 229

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31.2 R 4,312,801
33.6 AQ 4,312,802
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45.9 NP 4,312,805
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CLASS 279

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315 4,312,529

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722 4,313,075
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100 LE 4,313,116
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4,313,152

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149 4,313,185

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319 4,313,187

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220 4,313,189
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299 4,312,703
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442 4,312,706
450 4,312,707

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CLASS 403

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CLASS 404

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35 4,312,601
100 4,312,602
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CLASS 405

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291 4,312,609

CLASS 406

128 4,312,607
171 4,312,608

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CLASS 411

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15 4,312,612
34 4,312,613
44 4,312,614
78 4,312,615
387 4,312,616

CLASS 414

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225 4,312,618
347 4,312,619
466 4,312,620
523 4,312,621
730 4,312,622
786 4,312,623

CLASS 415

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CLASS 416

96 R 4,312,625

CLASS 417

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363 4,312,627
424 4,312,628

CLASS 418

191 4,312,629

CLASS 422

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30 4,312,833
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348 4,312,846
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350 4,312,850
359 4,312,851
393 4,312,852

CLASS 424

1 4,312,853
4,312,854
59 4,312,855
145 4,312,856
177 4,312,857
180 4,312,859
181 4,312,858
199 4,312,860
220 4,312,861
228 4,312,862
230 4,312,863
238 4,312,864
243 4,312,865
244 4,312,866
248.5 4,312,867
249 4,312,868
250 4,312,869
258 4,312,870
263 4,312,871
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4,312,874
266 4,312,875
267 4,312,872
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273 R 4,312,878
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4,312,880
4,312,881
275 4,312,882
279 4,312,883
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330 4,312,887

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CLASS 426

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466 4,312,890
573 4,312,891
626 4,312,892

CLASS 427

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34 4,312,894
67 4,312,895
96 4,312,896
4,312,897
130 4,312,898
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181 4,312,900
236 4,312,901
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214 4,312,908
215 4,312,909
220 4,312,910
224 4,312,911
244 4,312,912
257 4,312,913
290 4,312,914
323 4,312,915
345 4,312,916
375 4,312,917
379 4,312,918
403 4,312,919
425.5 4,312,920
446 4,312,921
4,312,922
4,312,923
4,312,924
484 4,312,925
571 4,312,926

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27 4,312,928
188 4,312,929
191 4,312,930
229 4,312,931

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122 4,312,933
294 4,312,934
296 4,312,935
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496 4,312,937
4,312,938
497 4,312,939
510 4,312,940
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253 4,312,948
272 4,312,949
295 4,312,950

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117 4,313,210
139 4,313,211
146 4,313,212
158 4,313,213
160 4,313,214
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260 4,313,219
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617 4,313,227
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90 4,312,954

CLASS 518

701 4,312,955

CLASS 521

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60 4,312,957
88 4,312,958
107 4,312,959
182 4,312,960

CLASS 525

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5 4,312,962
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88 4,312,964
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CLASS 526

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125 4,312,968
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279 4,312,970

CLASS 528

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63 4,312,972
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114 4,312,974
176 4,312,975
179 4,312,976
241 4,312,977
300 4,312,978

CLASS 536

1 4,312,979
76 4,312,980
84 4,312,981

CLASS 542

418 4,312,982
429 4,312,983
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457 4,312,985

CLASS 544

26 4,312,986
196 4,312,988
346 4,312,987

CLASS 546

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CLASS 548

379 4,312,990

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39 4,312,991
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CLASS 556

419 4,312,993

CLASS 560

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CLASS 564

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189 4,312,997
205 4,312,998
206 4,313,001
279 4,312,999
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493 4,313,005

CLASS 568

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376 4,313,007
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948 4,313,010

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269 4,313,018
429 4,313,019
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818 4,313,013
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828 4,313,015
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93 262,760
114 262,759
129 262,761
157 262,762
262,763
181 262,764
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54 262,767
262,768
99 262,769
147 262,770
D8— 66 262,772
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373 262,774
402 262,775
D9— 376 262,776
383 262,777
404 262,778
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126 262,780
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262,787
D12— 137 262,788
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198 262,814
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230 262,816
238 262,817
243 262,818
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D23— 136 262,820
150 262,821
D24— 8 262,822
28 262,823
31 262,824
D25— 25 262,825
30 262,826
62 262,827
D26— 2 262,828
84 262,829
93 262,830
D27— 03 262,831
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D30— 45 262,834
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30 4,814
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4,817
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01 :	4,312,160	4,312,643	4,312,390	4,312,342	4,313,218	4,312,845
	4,312,413	4,312,665	4,312,423	4,312,393	18 : 4,312,104	4,312,946
	4,312,507	4,312,667	4,312,468	4,312,411	4,312,186	4,312,951
	4,312,538	4,312,675	4,312,479	4,312,416	4,312,201	4,312,965
	4,313,077	4,312,687	4,312,509	4,312,427	4,312,379	4,313,042
04 :	4,312,272	4,312,706	4,312,573	4,312,455	4,312,407	4,313,116
	4,312,819	4,312,760	4,312,877	4,312,458	4,312,529	4,313,170
	4,313,082	4,312,767	4,312,878	4,312,459	4,312,648	4,313,196
	4,313,158	4,312,829	4,312,892	4,312,481	4,312,670	4,313,212
05 :	4,312,852	4,312,860	4,312,919	4,312,482	4,312,682	25 : 4,312,089
	4,313,032	4,312,873	4,312,922	4,312,493	4,312,695	4,312,096
06 :	Re.30,856	4,312,897	4,312,963	4,312,515	4,312,803	4,312,117
	4,312,080	4,312,913	4,312,988	4,312,542	4,313,029	4,312,154
	4,312,108	4,312,926	4,313,165	4,312,558	4,313,062	4,312,238
	4,312,114	4,312,938	4,313,201	4,312,575	4,313,067	4,312,282
	4,312,121	4,313,030	10 : 4,312,451	4,312,578	4,313,130	4,312,307
	4,312,130	4,313,033	4,312,593	4,312,595	4,313,134	4,312,324
	4,312,153	4,313,036	4,313,000	4,312,602	19 : 4,312,138	4,312,361
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	4,312,171	4,313,057	4,312,211	4,312,714	4,312,322	4,312,582
	4,312,199	4,313,086	4,312,338	4,312,725	4,312,347	4,312,628
	4,312,223	4,313,113	4,312,532	4,312,743	4,312,408	4,312,903
	4,312,271	4,313,118	4,312,624	4,312,744	4,312,750	4,312,909
	4,312,274	4,313,120	4,312,691	4,312,747	4,312,755	4,312,915
	4,312,276	4,313,126	4,312,719	4,312,778	4,313,076	4,312,939
	4,312,292	4,313,127	4,312,737	4,312,779	4,313,094	4,312,960
	4,312,295	4,313,135	4,312,908	4,312,788	20 : 4,312,083	4,312,962
	4,312,313	4,313,146	4,313,119	4,312,789	4,312,245	4,313,048
	4,312,326	4,313,153	4,313,139	4,312,791	4,312,299	4,313,080
	4,312,330	4,313,160	4,313,161	4,312,792	21 : 4,312,363	4,313,148
	4,312,346	4,313,162	4,313,195	4,312,799	4,312,388	4,313,154
	4,312,360	4,313,174	13 : 4,312,178	4,312,800	4,312,625	4,313,159
	4,312,373	4,313,175	4,312,335	4,312,806	4,312,749	4,313,178
	4,312,381	4,313,190	4,312,444	4,312,814	4,312,762	4,313,202
	4,312,385	4,313,191	4,312,477	4,312,887	4,312,999	4,313,204
	4,312,391	08 : 4,312,193	4,313,059	4,312,891	4,313,018	26 : 4,312,100
	4,312,396	4,312,447	4,313,183	4,312,901	4,313,043	4,312,190
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	4,312,436	4,312,731	4,312,890	4,313,011	4,312,306	4,312,291
	4,312,464	4,312,740	17 : Re.30,853	4,313,015	4,312,345	4,312,433
	4,312,466	4,313,112	4,312,145	4,313,020	4,312,415	4,312,439
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	4,312,480	09 : Re.30,855	4,312,157	4,313,070	4,312,514	4,312,463
	4,312,497	4,312,107	4,312,191	4,313,089	4,312,857	4,312,521
	4,312,516	4,312,111	4,312,200	4,313,099	23 : 4,312,086	4,312,524
	4,312,530	4,312,135	4,312,226	4,313,100	4,312,278	4,312,526
	4,312,555	4,312,169	4,312,241	4,313,131	24 : 4,312,224	4,312,527
	4,312,556	4,312,235	4,312,280	4,313,132	4,312,349	4,312,535
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	4,312,613	4,312,254	4,312,325	4,313,208	4,312,765	4,312,684

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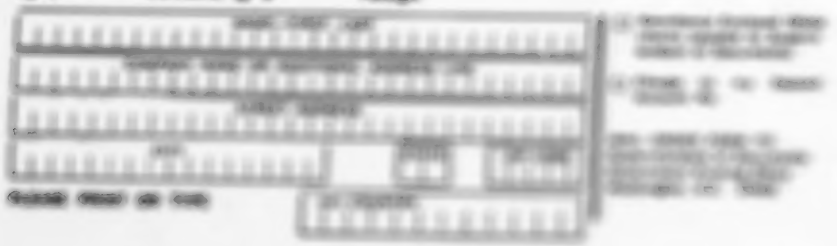

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